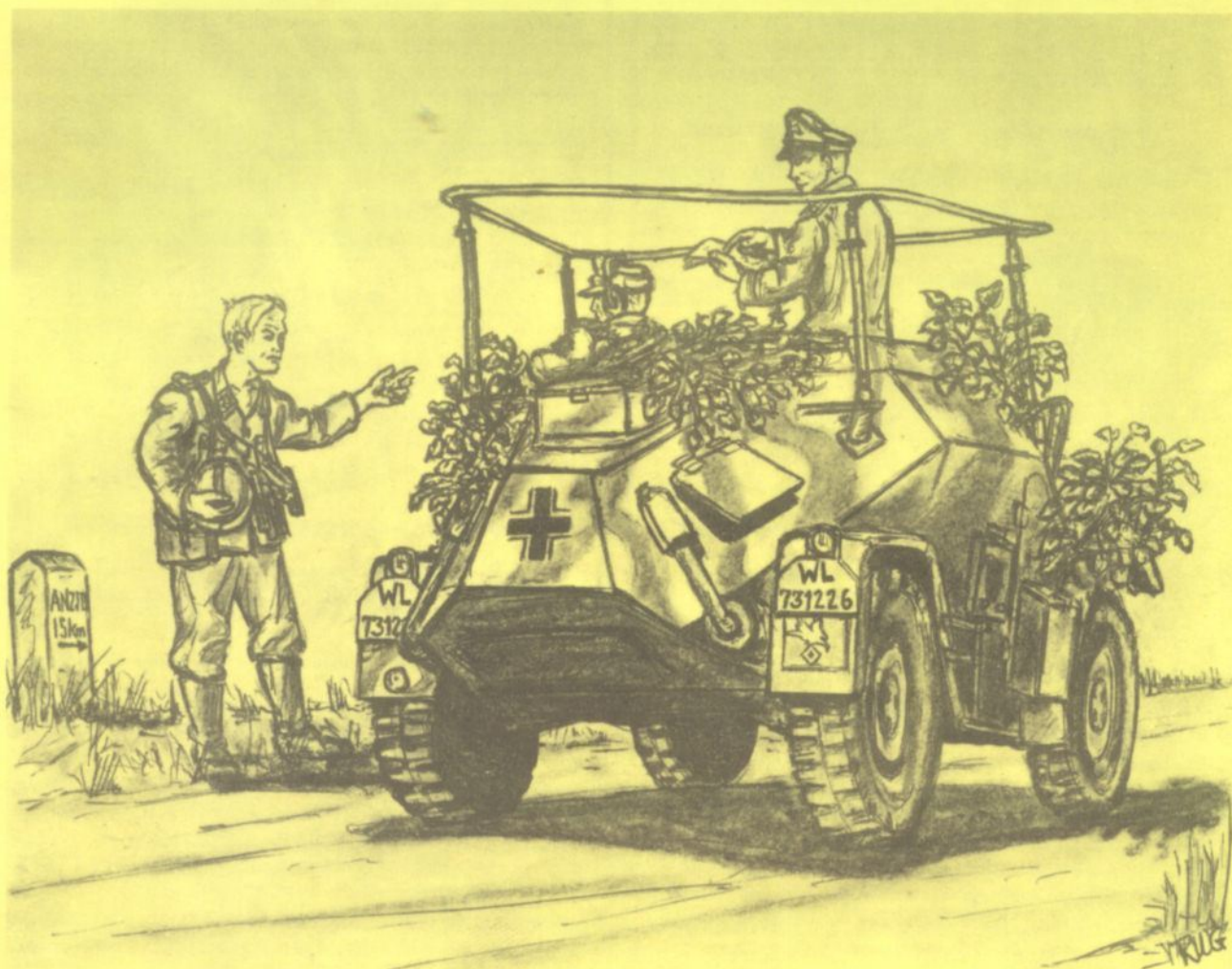




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Volume 3 Number 11



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As in the past several issues, AFV-G2 is continuing to present the first complete illustrated history of the Armored Fighting Vehicles of the Italian Army. Authored by Dr. Nicola Pignato, a widely-known historian on the Armed Forces of Italy, this serialized book is available only to readers of AFV-G2. The portion of the book in this issue will be found at the center of the magazine, between pages 18 and 19, bound in with the regular pages. To remove the center supplemental sheet in this issue, use a razor blade or sharp knife to carefully slit between the staple holes in the sheet, which will then be free of the magazine. Readers may then punch the supplemental sheets with a three-ring binder punch and install them in a separate binder. When placed together with the other supplemental sheets from AFV-G2, the complete series will present a detailed history of all Italian armored vehicles, with numerous previously-unpublished photographs and 1:50th scale drawings. The sheets are separately numbered for ease of binding, and at the end of the publication, a complete index and table-of-contents will also be furnished to readers in order to complete the book.



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COVER: A Luftwaffe 4-Wheel Light Armored Car (Sd.Kfz. 261) of the "Hermann Göring" Panzer-Division pauses for directions while on its way to the Anzio front. Our cover pen-and-ink drawing is by Robert Garbisch. For more on Anzio, see the article starting on page 4.....

EDITORIAL STAFF

Editor _____ James G. Steuard
 Assistant Editor _____ William E. Platz
 Art Director _____ Steven R. Cobb
 Art Staff _____ Robert W. Garbisch
 _____ Dwight McLemore
 Circulation _____ S. L. Steuard
 _____ John G. Yonos
 _____ D. L. Otto
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ANZIO



'The Soft Underbelly of Europe'

Part I.

by John Yonos

Prime Minister Winston Churchill had always emphasized the "soft underbelly of Europe" in his strategy for the war in the Mediterranean; he stressed that an attack through this area would weaken the German war machine so that the eventual cross-channel invasion would produce fewer casualties and secure a beachhead quickly. Unfortunately, neither of these conditions occurred at the time of the D-Day invasion, and the Italian campaign proved to be anything but SOFT.

In October 1943, the Italian front lines were located south of Cassino. The rugged mountains aided the German defenders, and extensive bunkers, pillboxes, mine fields and other such devices were used where nature did not provide enough help. Each bunker and pillbox had to be destroyed by concentrated artillery fire and then stormed by infantry. The terrain limited the use of armor and the battle for Italy was mainly an infantry one. At Cassino, a stalemate had developed, where the extensive German fortifications were almost impregnable.

Italian campaign policies and decisions had been made at Casablanca. Now, with "Operation Overlord" (the codename for the cross-channel invasion of Europe) massing every available man and machine, Italy was in last place for men and materiel. Italy had become to the Allies what North Africa had been to Hitler.

However, with the Allies stalled below Cassino (and therefore south of Rome), Churchill wanted action. The Joint Chiefs of Staff realized that the Italian campaign was bogged down, but at this time they were more involved in planning Operation "Overlord". Churchill now suggested a flanking attack or "end run", and with all of that coastline, it was a natural plan for attack.

Out of Churchill's suggestion (or more accurately "insistence") came Operation "Shingle". This operation was first discussed at La Marsha, Tunisia in October and November of 1943. General Dwight D. Eisenhower and his staff were discussing how to add impetus to the lagging Italian campaign, and General Sir Harold R. L. G. Alexander proposed, at Churchill's request, that an amphibious landing be undertaken on the right (western) flank of the enemy with the final objective of capturing Rome.

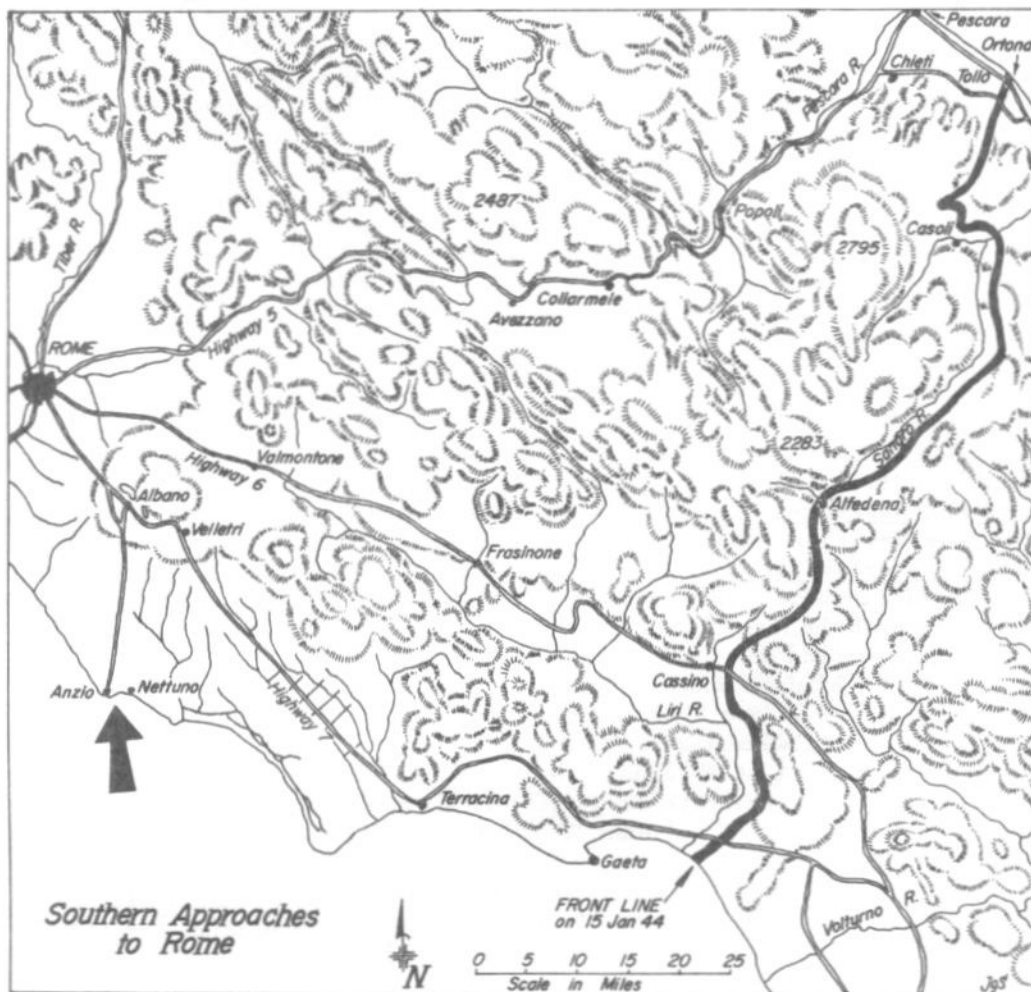
Operation "Shingle" would land a force behind the German lines in the vicinity of Anzio and Nettuno. This force would then proceed to and secure the Albano Hills, thus cutting off the supply roads (Highways 6 and 7) to the Cassino area. It was hoped that this would force the enemy to withdraw from his excellently prepared positions.

When it was determined that a minimum of two divisions would be needed to complete this mission, it was discovered that insufficient transport was available. Churchill immediately wired President Roosevelt asking for the retention of 56 LST's (Landing Ship, Tank) that were slated for a return to England. Surprisingly, both President Roosevelt and General George Marshall agreed, providing that Operation "Overlord" would not be jeopardized.

Fifth Army was having quite a bit of trouble with the defenses of the German Winter line, and they still faced the main Gustav Line, a line of fortifications built by the Todt Organization. It was recognized that the Anzio force would have to hold out longer than first expected, and in Tunis, it was decided to "beef-up" the landing force. In the two months preceding the landing (November to January) the force grew from 24,000 men to over 110,000. With greater strength, it was hoped that the beachhead could be held until a linkup with Fifth Army could take place a month after the landing.

While the Allied command was planning for "Shingle", the German commander, Feldmarschall Albert Kesselring, had made plans for the containment and possible destruction of any amphibious landings on the Italian coasts behind his front lines. These plans included moving troops from Austria, Yugoslavia, northern Italy and southern France. Each possible landing point had been identified and had been assigned a code name.

In November 1943, General Mark Clark, the commander of the U.S. Fifth Army, was told to draft plans for "Shingle". In December, the operation was called off. In early January, it was on again, but on a much larger scale. Major General John P. Lucas, the new commander of the U.S. VI. Corps, was put in charge of the landing. Since supplies would be critically needed from the beginning, a new method of loading was used. Amphibious 2-1/2 ton trucks (DUKW's), known as "Ducks", were preloaded with 5 tons of materiel and then backed onto the LST's and LCT's (Landing Craft,





*Shoulder Sleeve Insignia-
U.S. VI Corps - "a white
number six on a blue
circular background"*

Tank). This arrangement allowed them to be unloaded by simply lowering the ramp of the landing craft a short distance off shore and letting the DUKW's drive off. This loading method was frowned upon by Churchill and the Mediterranean Command. In fact, they ordered that the old method, unloading a Liberty ship by hand onto smaller amphibious craft, be used. Fortunately, this order was "lost".

The convoy set out from Naples at 0500 hours on 21 January 1944 heading south around Capri so as to deceive the enemy. Many civilians seeing the Allies off called out, "Have fun in Roma" or "See you in Roma". Minesweepers cleared the way of mines, destroyers hugged the flanks to ward off enemy E-boats and submarines, and aircraft were constantly overhead in case of enemy attack from that quadrant. At 0500 hrs. on 22 January, the convoy dropped anchor off Anzio. Assault craft were lowered and troops boarded them. No pre-invasion bombardment had been ordered; only a rocket bombardment by three LCT(R)'s (Landing Craft, Tank, Rocket) to explode enemy mines and clear the beachhead of enemy infantry.

The Rangers, an American and Canadian unit based on the British Commandos, under Colonel William O. Darby, were landed at the Riviera Di Levante. A folbot (folding canvas boat) under command of Ensign Henry W. Noel, USNR, went into position 400 yards off the exact center of the beach at 0115. At 0150 hrs. the beacon lamp was lit so that the assault waves would have a reference point. There was to have been a rocket barrage from an LCT(R), the HMS LCT-147, but it arrived too late to fire without fear of hitting the assault force. The Rangers achieved complete surprise, capturing German engineers before they could blow-up the harbor.

Peter Beaches, the landing zones for the British 1st Infantry Division and the 2nd Special Service Brigade (9 and 43 Commandos), under Major General W. R. C. Penny, was marked by the beacon submarine, HMS Ultor. At 0153 hrs., LCT(R)'s laid a barrage on the beaches to explode mines; however, not all of the mines were detonated. As a consequence, heavy congestion occurred at the water's edge as the men waited for paths to be cleared. HMS Palomares, carrying a standby fighter direction crew, struck a mine and had to be towed to Naples. German shelling, anti-personnel mines and sea mines caused Peter Beaches to be abandoned as unloading points on 23 January.

In the American sector, X-Ray Beaches were on firmer sand. The beacon submarine, HMS Uproar, lit the way for the U.S. 3rd Infantry Division under Lt. General Lucian K. Truscott. LCVP's (Landing Craft, Vehicle and Personnel) landed the initial assault troops on the beaches, dryshod and standing up. Enemy outposts were quickly taken; four drunken Germans were captured while riding around in a staff car as well as many others who were "sleeping it off". In the third wave, though, LCI-211 grounded on the wrong beach in water too deep for troops to wade to shore. As the troops were being transferred to LCVP's, enemy heavy machine guns opened-up, causing several casualties mostly among the Navy personnel.

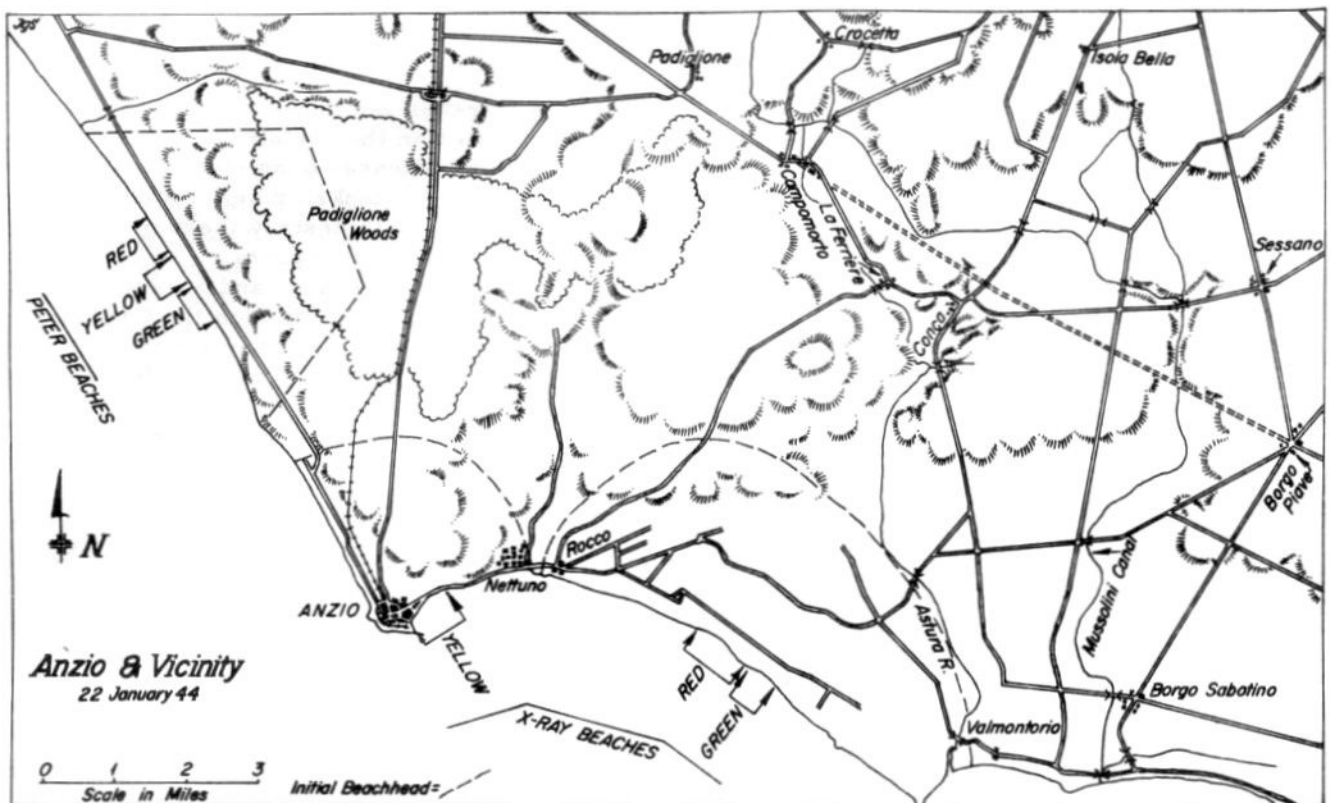
Casualties were lighter than expected in this assault because: 1) The German general order for a full alert had been recinded after two days, on the night of 21 January; 2) There were only three engineer companies and a very battered infantry unit, the II. Bataillon, Panzer-Grenadier-Regiment 71., to cover thirty miles of coastline. The other two defending German divisions had been ordered to bolster the Gustav Line only three days before; and 3) German intelligence had informed Feldmarschall Kesselring that an amphibious attack could not possibly occur for another two weeks.

However, German reaction to the landings was swift. As dawn arrived, so did the Luftwaffe! Six Messerschmidt Bf-109's broke through the Allied fighter cover to bomb and strafe X-Ray Beach Red, setting some loaded vehicles on fire. At 1010 hours, the minesweeper Portent struck a mine and sank with the loss of 18 men. Another air-raid, this time from Focke-Wulf FW-190's, hit Beach Red again, and this time, LCT-20 was lost.

By midnight of 22 January, 90% of the supplies and personnel of the convoy had been landed. Overall casualties to the Allies were 13 killed, 97 wounded and 44 missing. Two-hundred and twenty seven prisoners were taken.

On the morning of 23 January, the Luftwaffe struck again. The destroyers HMS Janus and HMS Jervis were the main targets. An aerial torpedo struck the Janus and broke her apart; she sank with the loss of 159 officers and men. The Jervis suffered no casualties but was forced to limp to Naples for repairs.

By the evening of 23 January, advance elements of the 30th Infantry Regiment (30th Infantry) and 3rd Cavalry Reconnaissance Troop, Mechanized (3rd Recon) had seized all of the bridges across the Mussolini Canal on the right flank of the beachhead. Most of the bridges were



retaken by enemy tank-infantry counterattacks. Captain Robert W. Crandall, commander of the 3rd Recon, left the Divisional Commander's headquarters to see how well his men were doing. As he drove up on one of the bridges, he noticed the men were retreating. He ordered them to turn around and fight; he then noticed that one of the soldiers was pointing a rifle at him. The troops that he had been exhaulting to fight were Germans, members of the "Hermann Göring" Fallschirm-Panzer-Division, and he was now their prisoner.

The next morning, the entire 30th Infantry, supported by tanks from the 751st Tank Battalion and tank destroyers from the 601st Tank Destroyer Battalion, retook the bridges in their sector. The Germans counterattacked the bridge on the Cisterna road north of Conca, but the supporting armor drove them off. Also on that morning, the 504th Parachute Infantry Regiment (504th) of the 82nd Airborne Division came in by landing craft. They relieved the 3rd Recon along the Mussolini Canal and retook the lost bridges in that sector. In two days, the VI. Corps had secured a beachhead seven miles deep into enemy territory.

On 24 January, the beachhead was held by the 504th on the right flank, along the main Mussolini Canal. On their left was the 15th Infantry Regiment (15th Infantry) and then the 30th Infantry. All but the 3rd Battalion, 7th Infantry Regiment (7th Infantry) had been relieved by the Ranger Force; all three of these regiments were from the 3rd Infantry Division. On their left was the 24 Brigade, British 1st Infantry Division, with 2 Brigade of the same division securing the left flank. No serious enemy activity occurred except along the main canal where elements of the "Hermann Göring" Division probed the positions of the 504th. These probes were usually in platoon strength and were supported by one or two tanks.

While the Allies were consolidating their gains, Feldmarschall Kesselring was marshalling his forces into the area south of Rome, under the codename "Fall Richard". The I. Fallschirm- (or Parachute) Korps headquarters under General Schlemmer was ordered back to the area; the first units of this command to arrive were elements of Fallschirmjäger-Regiment 4, and the "Hermann Göring" Division. Although the Allies had air superiority over Italy, German forces continued to pour into the Anzio area. For the first two days, the Germans were too weak to prevent an Allied advance towards the Albano Hills, but by the evening of 24 January, the Germans were strong enough to contain such an advance.

On 24 January, the German Fourteenth Army, under General Eberhard von Mackensen, was shifted to command the forces around Anzio. By 28 January, the following defense sectors were assigned: "Hermann Göring" Division was to defend the eastern sector (before Cisterna); the newly arrived 3. Panzer-Grenadier-Division was assigned the central sector (before Campoleone) and the 65. Infanterie-Division took the western sector. Behind these forces, other German units were

grouping for a counterattack.

Under the Mussolini regime, part of the Pontine Marshes had been drained and the fascist equivalent of farm communes and villages had been constructed on the reclaimed land. The Italian farm houses were built of stone like fortresses. Initial German defenses consisted of machine guns and infantry placed in and around these houses with anti-tank guns, tanks or self-propelled guns in support. Allied artillery, tank destroyer or tank fire was necessary to destroy these positions, and the houses could be abandoned at will, to be later established as defensive posts.

Before dawn on 24 January, the 30th Infantry sent two rifle squads and a section of light machine guns as a patrol across the Mussolini Canal to take a road junction on the Carano-Ponte Rotto road. The patrol was under the command of T/Sgt. Myles L. Sutton. As they reached a position near the junction, entrenched enemy machine guns opened up; Sgt. Sutton was wounded and S/Sgt. Maurice B. Allender took command of the patrol's withdrawal.

That afternoon, Company L, 30th Infantry, with tanks and tank destroyers supporting, went across the Mussolini Canal over much the same route as the earlier patrol to capture the road junction. Company F went across the bridge immediately to the right of Company L with the objective of capturing another road junction some 4000 yards to the right. The company, under Captain B. T. Packwood, aggressively attacked tanks, self-propelled and 20mm guns although their heaviest weapons were .30 caliber machine guns and 2.36" bazookas. They captured four enemy strongpoints located on a knoll, but as they pushed on they were subjected to such intense fire, particularly from 20mm guns, that they were stopped 500 yards short of the road junction.

Meanwhile, Company L under Captain Maurice L. Britt moved out to take the road junction already mentioned about mid-afternoon. Just before dark they ran into an enemy occupied farm house; enemy machine guns blazed at the men as they walked past in double columns. The house was quickly taken with grenades. Strange noises came from the next house, grenades were tossed, and out came a severely wounded cow, which was soon put out of its misery. By now it was dark. When Company L neared the junction, Capt. Britt deployed one platoon to the left of the road, but as the platoon advanced the Germans began firing tracers into a haystack immediately behind the platoon, setting it ablaze. This fire clearly silhouetted the men, and they quickly sought cover in a drainage ditch. On the right it was still dark and the other platoons advanced on the road junction. Suddenly, a four-engined German bomber crashed nearby the scene, there was another blaze, and another scurry for a drainage ditch. Tanks and TD's were called-up to extricate Company L from the fight.

The next morning, Company L was within 250 yards of the junction; however, the Germans still held onto it. In order to find enemy positions for the fire of the tanks, Capt. Britt stepped out into the open and did the calisthenics exercise known as the "jumping jack". After several weapons fired at him, Capt. Britt directed fire from friendly tanks and tank destroyers in return.

That night, the 2nd Platoon under 2nd Lt. Francis L. Prall started to flank the Germans at the road junction, while the rest of the company created a diversion on the other side. The 2nd Platoon walked through the slime of a swamp into the attack. The diversion worked until the platoon was through the swamp, then intense machine gun and 20mm fire pinned them down. However, the enemy was forced to give up the road junction, now called "Britt's Junction".

On 25 January, the attack of Company F was relieved by the 1st Battalion, 30th Infantry. As they jumped-off to take their road junction, they came under heavy enemy artillery fire and the attack was stalled. The regimental commander, Lt. Col. Lionel C. McGarr, came up to the Battalion CP around 1400 hours and inspired the men to carry the attack to a successful conclusion. The newly captured junction was called "Kinney's Corner", after the name of the 1st Battalion commander.

The 2nd Battalion, 15th Infantry launched an attack on the right flank of the 30th Infantry, along the Conca-Cisterna road. Enemy machine gun fire held them up so that by the end of the day, they had advanced only 1-1/2 miles. Tanks and TD's were used to knock out most of the enemy positions. Company C, which was making a diversionary attack up the parallel road on the right, also became bogged down and four of the accompanying tanks were knocked out by a German assault gun.

To further assist the attacks of the 30th Infantry, the paratroopers of the 504th made another diversionary attack across the Mussolini Canal. They advanced behind a heavy curtain of fire from Corps artillery and navy ships. However, beyond Borgo Piave, Company D of the 504th was cut-off by an enemy counterthrust from five tanks and eight Flakwagens of the "Hermann Göring" Division. Company D suffered several casualties, but most of the men managed to filter back to friendly lines and safety.

Part II. will cover action taking place inland from Peter Beaches, with the British.

"THE MODELING OF THE ARMORED VW KUBELWAGEN"

BY F.J. "RICK" TYSON

This article introduces a little-known version of the famous German World War II jeep - the Pkw. K1 (Type 82) Kübelwagen. This is the armored version, with a complete turret containing an MG-34 and bullet-proof glass and sand-filled tires. This production model numbered between 80 and 100 units and had decreased range, but otherwise, all other specifications were as for the regular military Volkswagen.

The armored VW-Type 82 was intended as a replacement for the Sd.Kfz.13 MG-34 carrier; this was built on the much-heavier Adler chassis. The armored VW was quickly used-up on the Russian front in 1941. Very few photographs exist of the vehicle today.

Modeling of this version requires one (1) Tamiya 1:35th Kübelwagen (MM-106) kit, one (1) package of Squadron Shop Sheet Styrene, and one (1) Armtec MG-34 kit.

Note: Transfer or carbon paper should be used with a 3H pencil to transfer lines from page to sheet styrene, placed underneath pages. Use a No.11 X-zcto blade to cut and/or score all cut and/or bend lines. Caution - Use straight edge on all cut lines and all bend lines to insure accuracy on the model.

REFERENCES: STRASSENPANZER, AERO ARMOR #5 BY W.J. SPIELBERGER

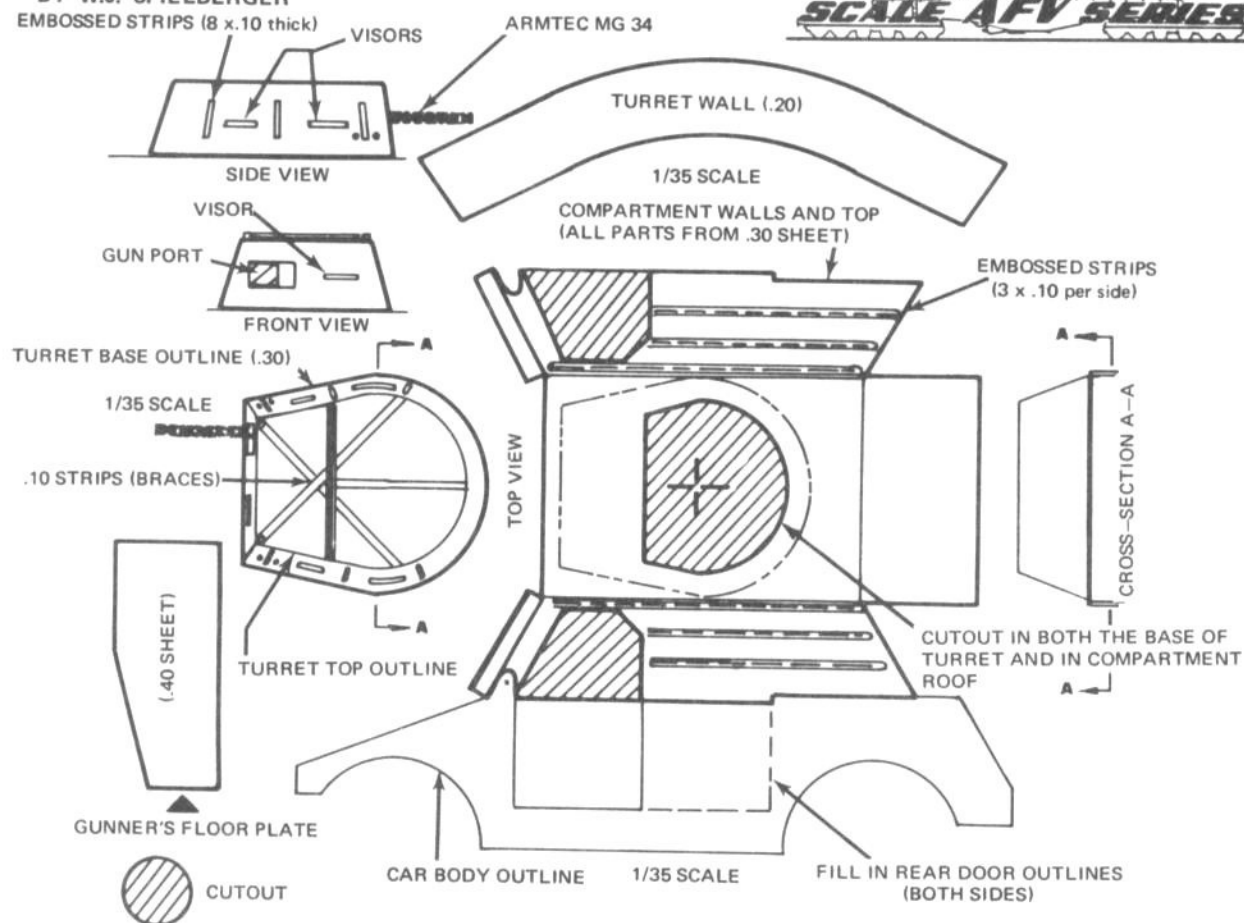
EMBOSSED STRIPS (8 x .10 thick)

VISORS

ARMTEC MG 34

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SCALE AFV SERIES



TANK versus TANK ... 1918

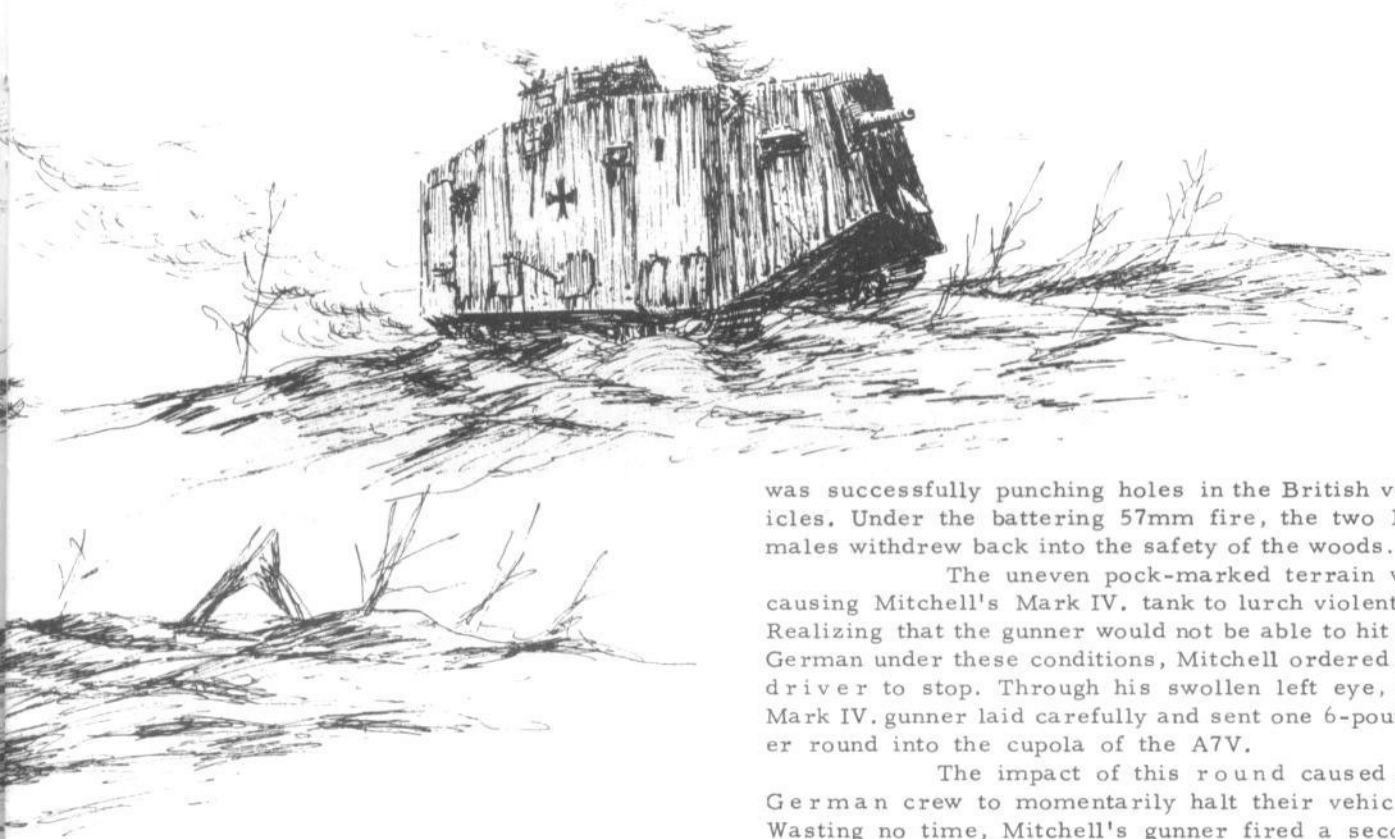
by Lt. Dwight C. McLemore



On the foggy morning of 24 April 1918, four "Storm" Divisions commanded by General Erich Ludendorff were hurled against the British lines along a four-mile front. Thirteen new German A7V tanks spearheaded the drive; three rumbled to the north while ten swept south. Wherever the German tanks made contact, British resistance collapsed, unable to cope with the new armoured threat. Villers-Bretonneux fell quickly to the German troops while the three northward-bound A7V's continued their ad-

vance towards the Cachy-Fouilloy road. The German assault appeared to be developing into a disaster for the British, however, "lying-up" in a small patch of woods called the Bois de l'Abbe between Villers-Bretonneux and Cachy was a force destined to change the course of the fight.

The Number One Section of the 1st Battalion, Tank Corps occupied the Bois de l'Abbe with two FEMALES and one MALE Mark IV. tank. A mustard gas attack on the previous day had left lingering effects on the crews; their primitive gas masks had provided only limited protection, resulting in the evacuation of two crew members from the area. The



commander of the section, Lt. Frank Mitchell, received a message that German forces had closed on the road from the woods to Cachy; under the painful presence of mustard gas, the tanks of Number One Section lumbered off to meet the German threat.

As the British section broke from the cover of the wood, Mitchell received word from the infantry that German tanks had been sighted. Alerting the crew of his Mark IV. (Male), Mitchell observed the three A7V's closing on the wood, followed by infantry. At approximately 300 yards range, Mitchell's gunner, half-blinded by mustard gas, fired two shots at the leading A7V, both of which missed their mark. The machine gunners on the lead A7V answered with bursts of armour-piercing fire which raked the Mark IV. Mitchell's gunner, dodging flying splinters, slaved over the 6-pounder; since his loader was evacuated earlier, the gunner was both loading and firing the crew served weapon. The next two rounds from the 6-pounder also missed the advancing A7V.

While the Mark IV. (Male) was being engaged by the side-port machine guns of the A7V, the two Mark IV. Females were baring the brunt of the 57mm Sokol gun mounted in the bow of the German tank. The Lewis machine guns of the Females did little damage to the A7V while the German gunner

was successfully punching holes in the British vehicles. Under the battering 57mm fire, the two Females withdrew back into the safety of the woods.

The uneven pock-marked terrain was causing Mitchell's Mark IV. tank to lurch violently. Realizing that the gunner would not be able to hit the German under these conditions, Mitchell ordered the driver to stop. Through his swollen left eye, the Mark IV. gunner laid carefully and sent one 6-pounder round into the cupola of the A7V.

The impact of this round caused the German crew to momentarily halt their vehicle. Wasting no time, Mitchell's gunner fired a second round into the bow of the A7V. The German tank began moving precariously across a steep bank, apparently trying to avoid the fire. Just as Mitchell's third round hit the enemy tank, the A7V lurched at an angle and overturned. As the German crew abandoned the tank, Mitchell's crew sent bursts of machine gun fire after them. Mitchell noted that the other two A7V's were now withdrawing; the Mark IV. lumbered off in pursuit until a direct hit from German artillery disabled the vehicle. Following this turn of events, Mitchell and his crew abandoned their tank and made for the nearest trench with the satisfaction of knowing tank they were the victors of the first tank versus tank engagement in history.

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ARMOR in VIETNAM

- 12 -

The M-48A3 Medium Tank

The tank shown in these two photographs is a M-48A3 of the 3rd Reconnaissance Squadron, 5th Cavalry, a unit of the 9th Infantry Division. Both photos show the amount of external stowage commonly carried into combat by these vehicles, and also the interesting field machine gun modification. Note the "blanked-off" aperture in the cupola and the replacement "ground style" M-2 .50 caliber machine gun swivel-mounted on the top of the cupola. The machine gun is mounted on the base of the standard ground tripod (minus the legs) which was welded to the top of the cupola mantlet. This modification allows the commander to swivel the machine gun rapidly through an arc greater than 90 degrees, and it was apparently made to provide the commander's machine gun with a larger quantity of ready ammunition (the previous internally mounted machine gun was mounted on its side and was fed from a 25-round metal basket which was difficult to replace in combat) and greater freedom of observation.

Spare track links were carried by this vehicle only on the right side of the turret. Note the boxes of "C" rations strapped on the opposite side of the turret; these were apparently tied to the turret hand rail with webbing straps.

M-16A1 rifles for both the Tank Commander and the Loader were carried on the outside of the tank where they were available in the event that the crew had to rapidly dismount. The commander's weapon is hooked over a strap fastened to one of the cupola vision blocks; another similar strap bolted to the other side vision block acts as a hook to hold the commander's web pistol belt when he is not in the vehicle.

Note the crew's helmets, still hooked to the tank by the communications cabling. The helmets are obviously left in position for immediate use in case the tank must get into action quickly.







The M-3 75mm Gun Motor Carriage

Part II. Vehicle Description

by Rick Fines

The armor construction of the T-12/M-3 75mm Gun Motor Carriage, as briefly covered in the previous installment, was of 1/4" plate built-up on an angle framework, over a conventional channel-section frame. Unlike monocoque-hulled German vehicles of the period, the armor of the T-12/M-3 contributed no structural support to the vehicle. Plates were fastened using round-head, countersunk machine bolts; nuts used were the so-called "shakeproof" type. All armor joints were simple butt connections. This feature, combined with slab sides, made the T-12/M-3 ballistically very poor, by comparison with Axis contemporaries.

The only areas in which the armor of the T-12/M-3 Gun Motor Carriage differed substantially from the personnel carrier version of the halftrack was in the windshield area. Specifically, the driver's compartment windshield armor, normally hinged from the header, was hinged from the hood so as to fold forward. Glass was dispensed-with and the header was eliminated to provide for gun depression and limited traverse. The personnel carrier gun rail (or ring) went the way of the header, so that all secondary armament consisted of field-expedient modifications.

The suspension of the T-12/M-3 GMC was rather unique in that it was identical to the personnel carrier - despite the extra load! A close look at photos of the T-12 indicates that the rear volute suspension was "flat" at all times! Since the personnel carrier rode rather harshly, one can only imagine how rough the T-12/M-3 was with full crew and ammunition load. (Note: The following description of the T-12 suspension and driveline does, of course, relate to other halftrack variants in the series.)

Tracks on the T-12 and other halftracks, usually described as "endless rubber-band-tracks", were actually rather more complex than the phrase would indicate. The core of the track

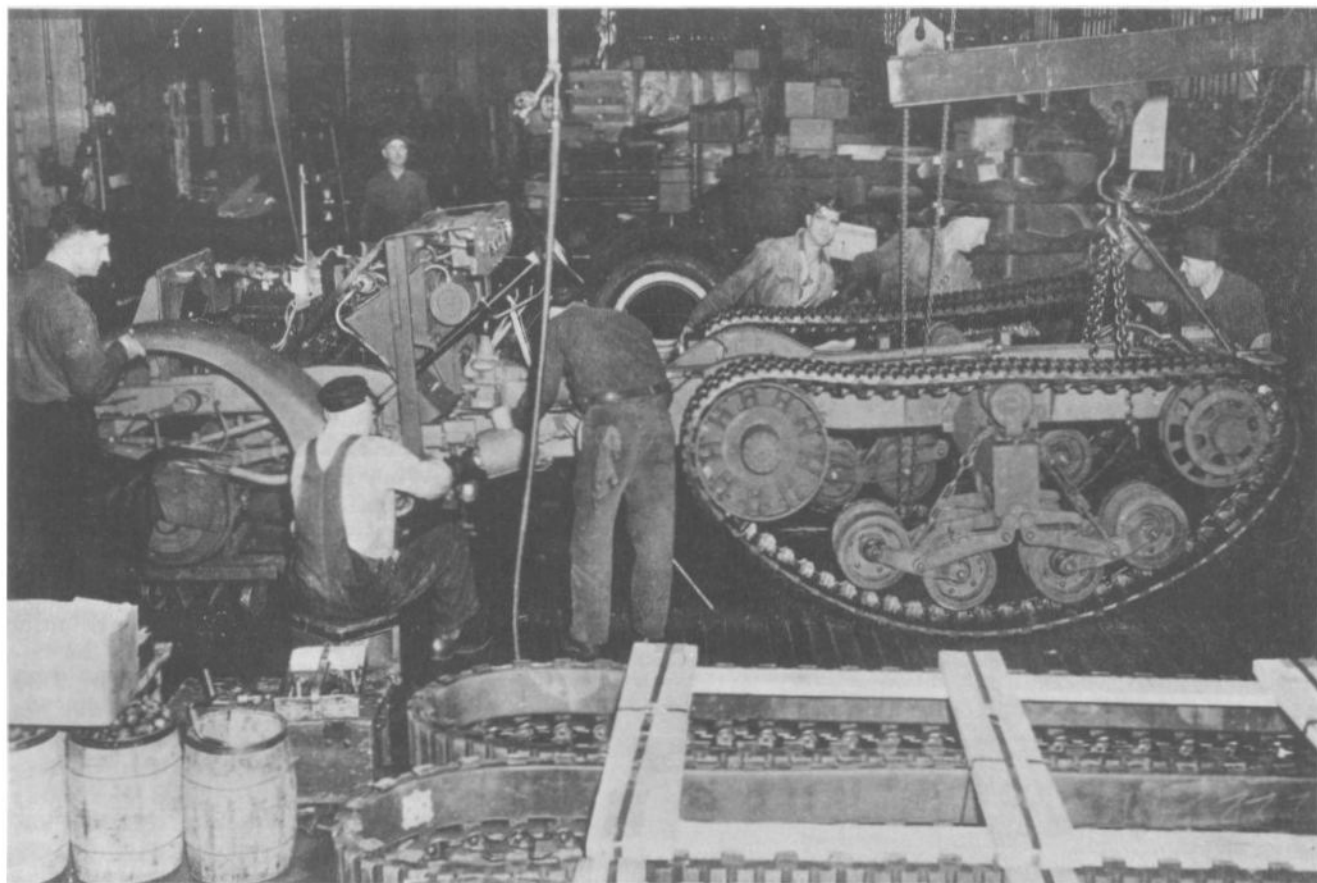
consisted of track-width steel plates, joined circumferentially by a series of steel cables. The steel core was then placed in a vulcanizing mold to accept the rubber outer section. When new, the tracks appeared quite rugged and impressive. However, there were many flaws in the design. If operated over rocky country, or even at high speeds on hard-surfaced roads, the tracks tended to throw lugs; thereby exposing the steel core plates. Continued operation caused cables to break which led to thrown tracks. Operation in gravelly areas caused the tracks to deteriorate from the action of small rocks being crunched between the bogie wheels and the tracks. If the foregoing didn't stop the vehicle, the solid tires tended to wear off the 16 bogie wheels until the steel rims dug into the track from the inside. Changing the track was quite an involved operation requiring jacks, turnbuckles, men and time. Even with good tracks, good bogie wheels and proper track tension, tracks were often thrown at inconvenient times. Under the best of circumstances, tracks did not last much longer than 1000 miles.

The brakes on the T-12/M-3, as well as other halftracks, were hydraulic, internally expanding shoe types boosted by a hydro-vac assembly. The hydro-vac booster had a rather unique disadvantage in that when it became defective, brake fluid was pulled into the engine intake manifold along with the fuel mixture. The result was a cloud of white smoke which made the halftrack the world's only armored mosquito fogger! Servicing the front axle brakes was not difficult, but relining brakes on the drive-train was something of a problem involving removal of the drive sprockets and complete track assemblies to gain access to the shoes.

The drive-train of the T-12/M-3 was quite conventional in front, with nothing more than a truck differential at the center driving sprockets which drove the tracks. The transmission was a 4-speed non-synchronized unit, in conjunction with a 2-speed transfer case and selector for engagement of the front axle drive. The clutch was a single dry-plate unit with no hydraulic assist.

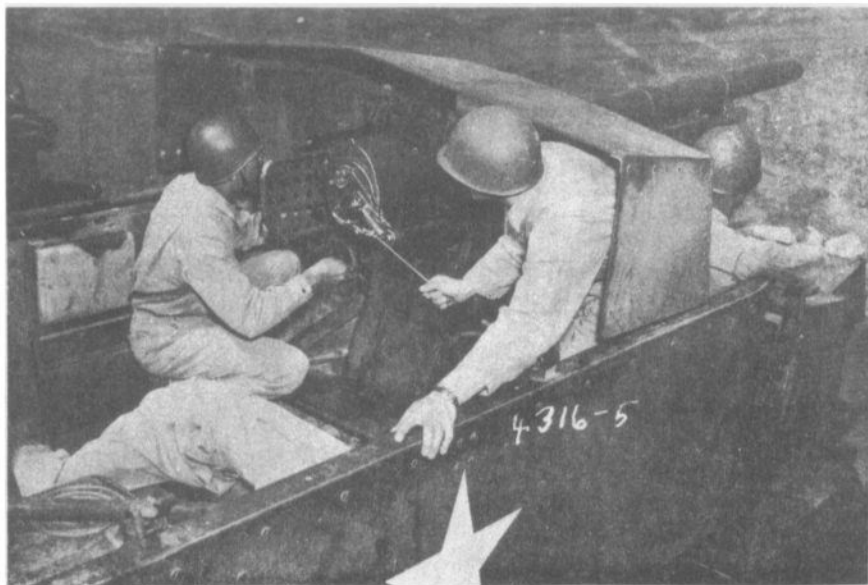
Steering was front axle only, via a Ross "Cam-lever" system with no power assist. When the vehicle was moving, steering effort was substantial. At rest, the steering wheel simply does not move! This nimble steering (sic.), combined with the unique lack of visibility (covered in Part I.) must have made the T-12/M-3 and its cousins a delight to drive in confined or tight areas.

Wiring in the T-12 and other halftrack variations had no provision for waterproofing and



Installation of an engine at the White Motor Corporation factory. This photo clearly shows details of the front of a typical White or Autocar halftrack. The photo on the opposite page, also taken at the White factory, shows installation of the "endless rubber band track". Note how the bogies are compressed on their springs with chain and two turnbuckles; this allows the tracks to be slipped onto the vehicle from the side.

Photos: Credit White Motor Corp.



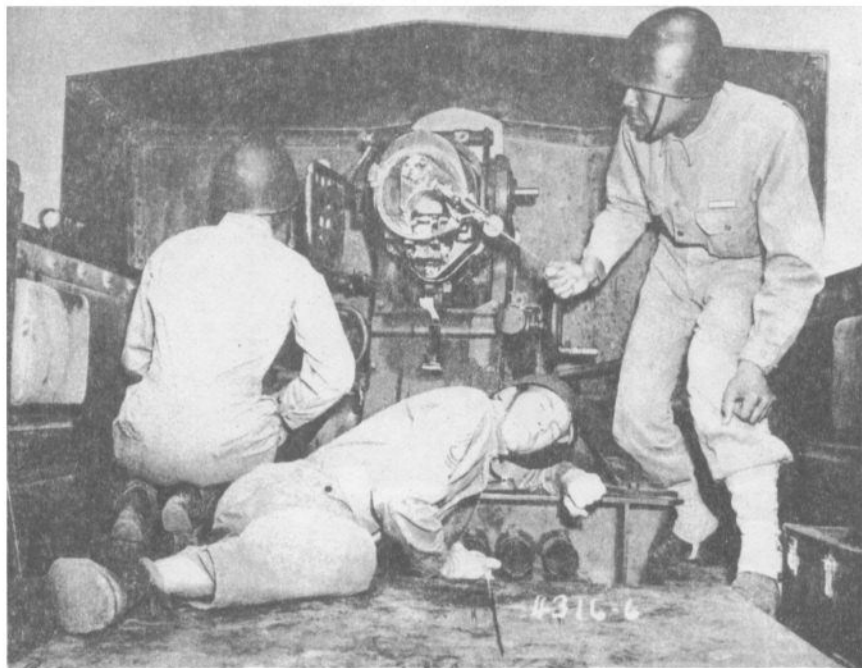
The above photo, taken from the Tank Destroyer Force manual, shows the gun of a typical M-3 75mm GMC at the moment of opening fire. The Assistant Gunner on the right has pulled on the lanyard and is awaiting the Gunner's command of "Fire" before releasing the cord. Note the crouched Loader.

Photo: R. Fines Collection

cause dust to be blowing about in the body(?). In any event, it is difficult to imagine that the system worked very effectively. No provision was made to prevent entry of dust or condensation into the commercial truck instrument cluster or into the mechanical tachometer. The latter was probably not a problem since the tachometer seldom worked under the best of conditions.

The ignition system on the T-12/M-3 was conventional battery/coil, which obviously was not as satisfactory as a magneto/coil combination would have been. However, the system was powered by a D8-D 12 volt battery and a generator of sufficient size to maintain the large battery. With decent battery service, cold starts, hot starts, etc., presented no problem.

The engine installation, discounting shortcomings in accessory groups, was probably the



Another photograph at the moment of opening fire. Note the awkward position of the Loader beneath the gun to escape the recoil. Seats for the gun personnel were very rudimentary and the gun crew had to exercise considerable teamwork to succeed in combat.

Photo: R. Fines Collection

no evidence of having been designed with vibration resistance in mind. Insulation was woven cotton, similar to that used in automobiles of the period. On production vehicles, no effort was even made to waterproof the primary ignition circuits.

Dust, obviously a problem in any vehicle designed for off-road use, should have been an object of concern in the design of the T-12/M-3. Obviously it was not. The only attempt to recognize and meet the dust problem was an air intake selector on late production vehicles. This modification provided for combustion air to be taken from a point under the dash on the firewall rather than from under the hood! The obvious conclusion was that conditions which caused dust to swirl under the hood would not

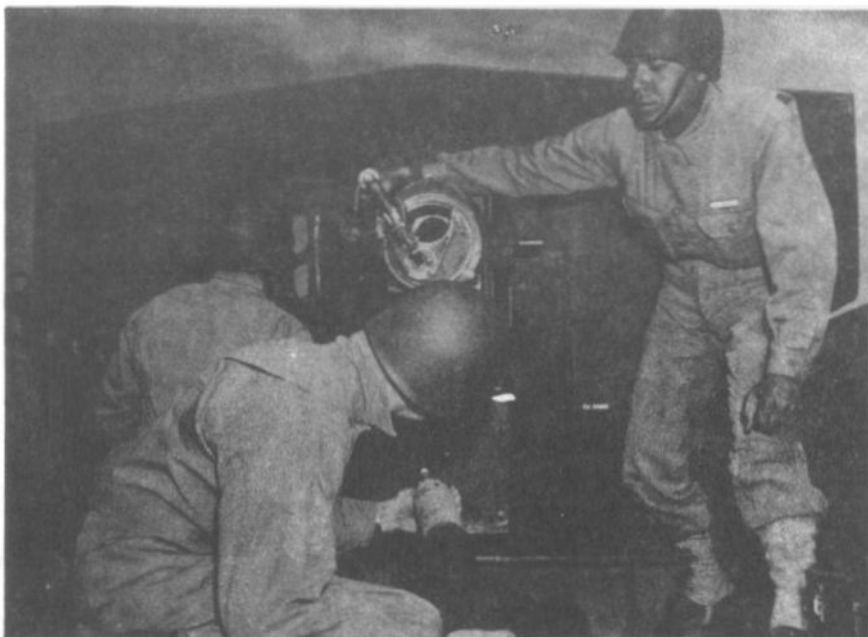
be the best feature of the vehicle. At the risk of generalizing, it seemed that the Germans were able to develop superior hull and suspension systems for their vehicles and the Americans were far ahead in the design of serviceable tractable engines capable of powering heavy vehicles. The White 160 series engine in the T-12 was a conventional American design of the period - large displacement, relatively low r.p.m. and HP output, very heavy and dead reliable. Probably the only point worthy of criticism was the hydraulic lifter assemblies. The motor oil of the period was not really compounded so as to be compatible with hydraulic lifter assemblies. The result was frequently stuck lifters and reduced power output.

Considering the state of the art in vehicle development even circa 1940, the only

logical conclusion has to be that neither the T-12 nor the entire halftrack series really had a reason to happen. Going back to the 1920's, it was apparent why the wheel-track combination was attractive to achieve low ground pressure and high flotation. Conventional truck tires for moderate and heavy vehicles of the period were simply too skinny to support a heavy vehicle on marginal terrain. Cunningham and Linn, as mentioned in Part I., made money on this fact. By the late 1930's, however, development of truck tires and rims had progressed sufficiently so that there was simply no reason why the halftrack series could not have employed a three-axle 6x6 configuration with dual 20" tires on the rear two axles and single 20" wheels on the front. The design was there; so was the war. There simply wasn't time to do better.

The 75mm gun and the facilities for the crew to service the piece were also antiquated. As the weapon was an 1897 designed-weapon, such modern developments as the semi-automatic opening breach had not been available when the gun was manufactured. This meant that a high degree of coordination had to be effected between the three members of the gun crew. The Gunner crouched on the left side of the gun (there were no crew seats except for pads to be used during marches), aiming the weapon with a simple telescopic tube sight and giving the commands of "Ready" and "Fire". On the command "Ready", the Assistant Gunner, crouched backwards on the right side of the gun, pulled the cord lanyard. On the command "Fire", he released the cord, permitting the gun to fire. Of course he had to exercise considerable agility to keep out of the path of recoil, especially when the gun was traversed to the left! After the gun fired, the Assistant Gunner opened the breach to eject the empty casing, while the Loader prepared to insert a new round of ammunition. While the gun was firing, the Loader had to crouch (or lie) flat on the floor to escape the long recoil. After the Loader exerted a hard push on the round (to seat it in the forcing cone), the Assistant Gunner closed the breach and got ready to fire again. If close coordination did not happen, or if someone became confused, a serious accident could happen. It took a lot of practice to train the gun crew! The Driver had to be ready to move the vehicle at the right moment; he was instructed to park the vehicle with the front

- Continued on Page 33 -

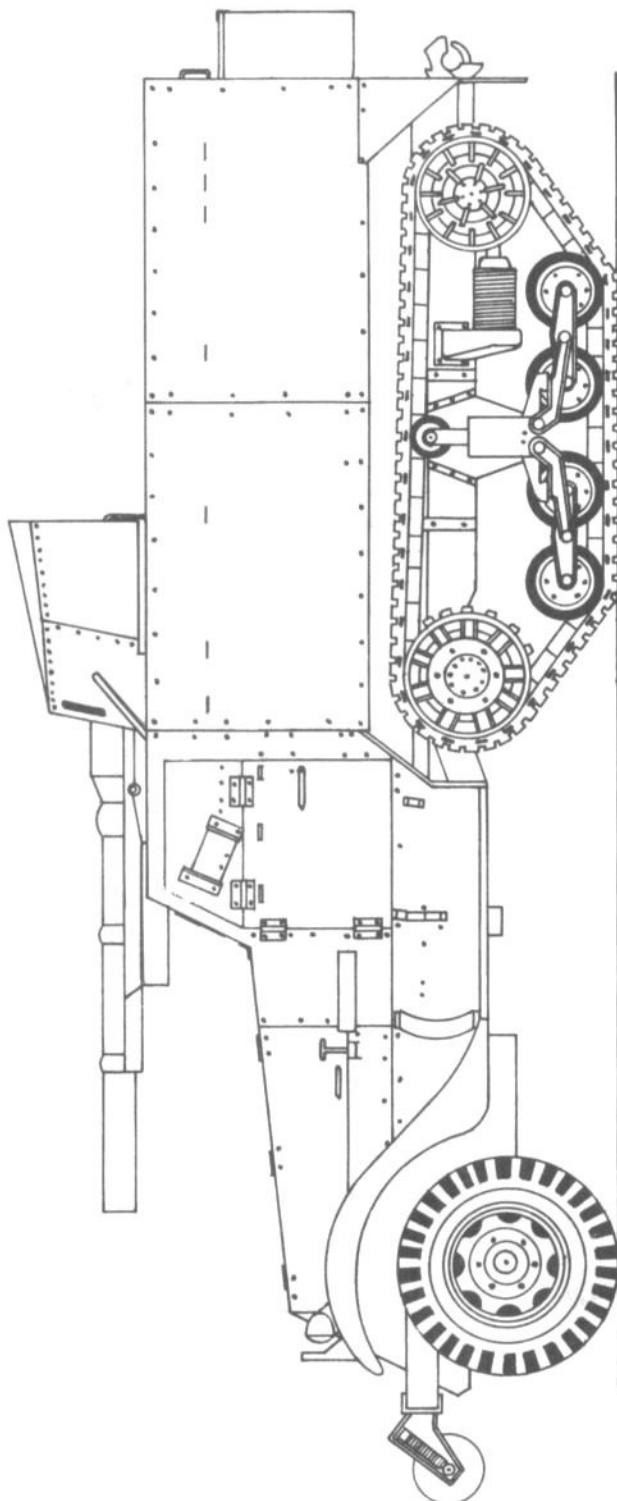
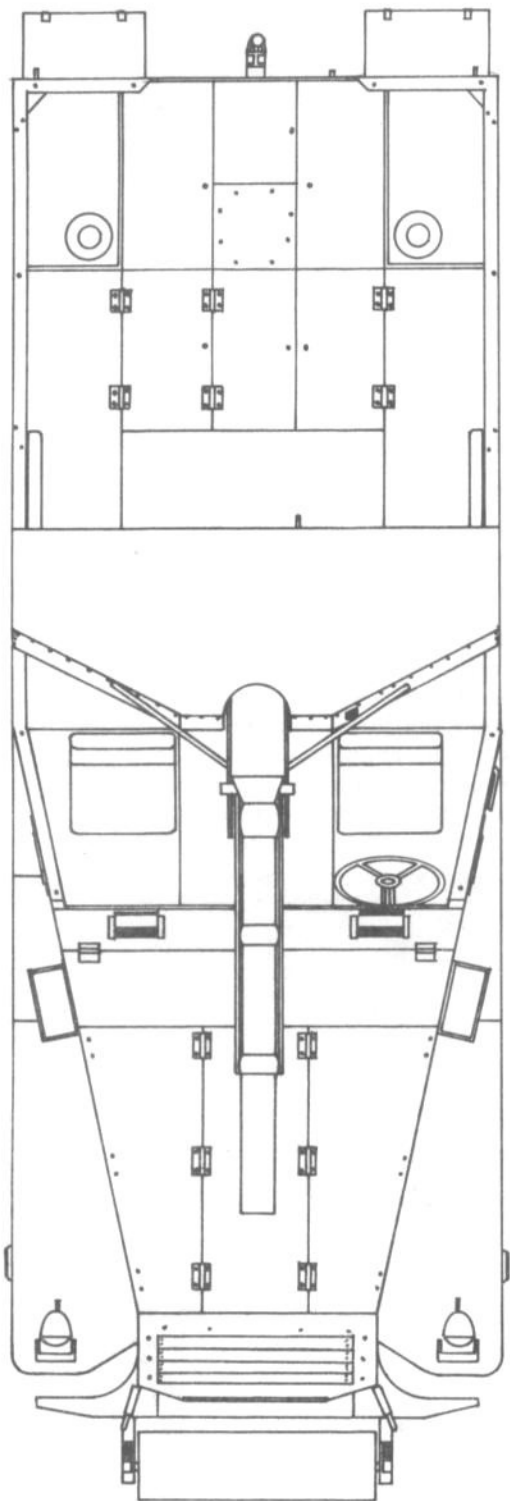


The photo shows the gun crew in the process of reloading the 75mm gun. The Assistant Gunner, on the right, has just finished opening the breach (which was not semi-automatic), and the Loader has extracted a shell from the ready racks (beneath the gun mount).
Photo: R. Fines Collection



In this photo, the Loader is inserting the projectile into the breach of the gun. The Assistant Gunner is waiting with his hand on the operating handle to close the breach at the proper moment. Note the ammunition racks beneath the gun mount.

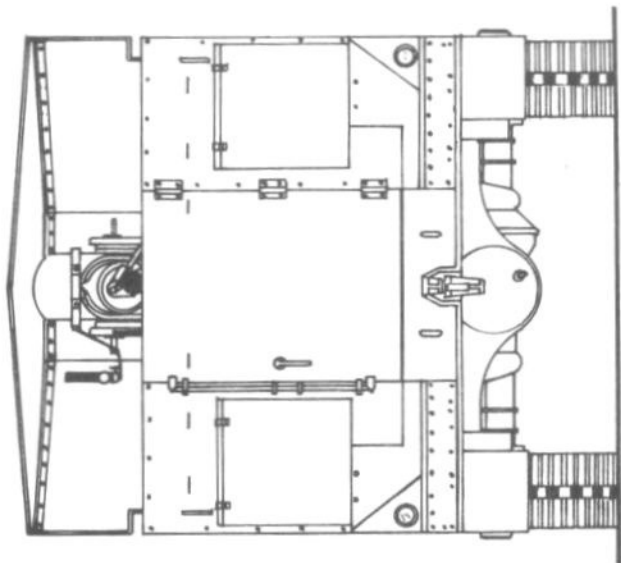
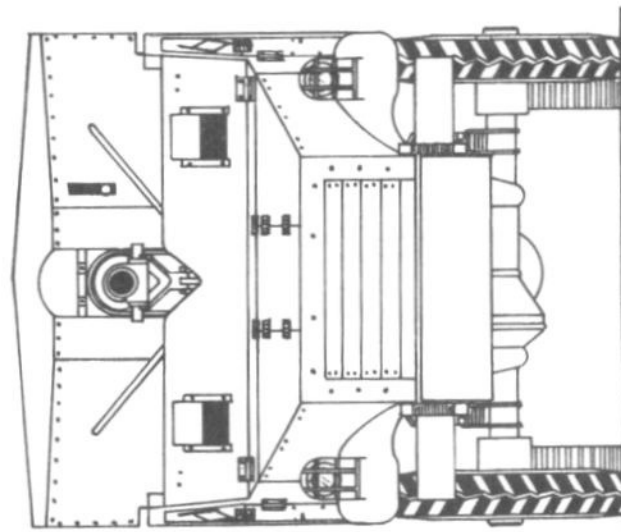
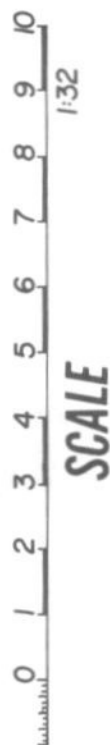
Photo: R. Fines Collection



M-3 75mm Gun Motor Carriage

DRAWN BY: STEVEN R. COBB

SCALE: 1/32 (3/8" = 1'-0")



A Penetrating Look at . . .



German

88mm AMMUNITION

by Mark Diehl

It would probably be a safe bet to say that every student of militaria is acquainted with the reputation of the almighty "eighty-eight". Some enthusiasts, among which are a fair number of wargamers, know something of the weapon's capability. The purpose of this article is to present information on 88mm ammunition, with particular emphasis on tank and anti-tank capabilities.

The 88mm gun came into existence as a big brother to the German 77mm antiaircraft gun of World War I. vintage. Initial models were also antiaircraft guns. These were models: Flak 18, Flak 36 and Flak 37. The differences between these successive models were subtleties such as mount changes and improved gunnery data transmission equipment. Ballistically, the models were identical, each mounting a gun that was 56 calibers in length. This same gun was mounted in the Tiger I, tank, designated as the Kw.K. 36. In addition to these guns, captured Soviet 85mm antiaircraft guns were bored-out to 88mm and rechambered for the 56 caliber ammunition.

With the tank busting ability of the 56 caliber weapon established, work began on further improvements. The result was a gun with a barrel 71 calibers in length and which was adaptable for antiaircraft, anti-tank, tank and assault gun mountings. These models were designated Flak 41, Pak 43 (and variants), Kw.K. 43 and Stu.K. 43, respectively. Again, as in the 56 caliber guns, the 71

TABLE I. GERMAN 88mm GUN EMPLOYMENT

Designation	Model	Cal.	Employment - Vehicle
Flugabwehrkanone	Flak 18,36,37	56	Antiaircraft with direct and indirect surface fire capability
" " "	Flak 41	71	" " " " " " " "
Kampfwagenkanone	Kw.K 36	56	Tank Gun, used on Sd.Kfz. 181 (Tiger I.)
" " "	Kw.K 43	71	Tank Gun, used on Sd.Kfz. 182 (Tiger II.)
Panzerabwehrkanone	Pak 43	71	Antitank Gun with Cruciform mount
" " "	Pak 43/41	71	Antitank Gun with Split-trail Wheeled carriage
" " "	Pak 43/1	71	Tank Destroyer Gun, used on Sd.Kfz. 164 "Nashorn," "Hornisse"
" " "	Pak 43/2	71	Tank Destroyer Gun, used on Sd.Kfz. 184 "Ferdinand," "Elefant"
" " "	Pak 43/3,-/4	71	Tank Destroyer Gun, used on Sd.Kfz. 173 "Jagdpanther"
Sturmkanone	Stu.K 43	71	Tank Destroyer Gun, used on Sd.Kfz. 184 "Ferdinand," "Elefant"
Flugabwehrkanone	Flak 39(r)		Captured Soviet AA Gun rechambered and bored-out for 56 caliber 88mm ammunition; designated 8.5/8.8cm Flak 39(r).

TABLE IV - PHYSICAL DETAILS OF 88mm PROJECTILES

ENTRY	1	2	3	4	5	6	7	8
GERMAN DESIGNATION:	Pzgr. Patr. 39	Pzgr. Patr. 41	Pzgr. Patr. m Bd Z	Pzgr. 39/43	Pzgr. 88cm	Pzgr. Patr. 39/41	Pzgr. 39	Pzgr. 40
FOR WEAPON:	Flak 41	Flak 36 Flak 41	Flak 18 Flak 36 Flak 37	Kw.K 43 Stu.K 43 Pak 43 Pak 43/41	Flak 18 Flak 36 Flak 37 Flak 39(r)	Pak 43 Pak 43/41 Kw.K 43 Stu.K 43	Flak 18 Flak 36 Flak 37 Flak 39(r) Kw.K 36	Flak 36 Flak 41 Kw.K 36 Kw.K 43 Pak 43
WEIGHT:	9.8 Kg.	10.36 Kg.	9.44 Kg.	10.36 Kg.	9.54 Kg.	10.23 Kg.	10.0 Kg.	7.27 Kg.
BURSTING CHARGE:	Cyclonite	Cyclonite	TNT/Wax	Cyclonite/Wax	TNT/Wax PETN/Wax	Cyclonite/Wax	Cyclonite/Wax	NONE
CHARGE WEIGHT:	50.4 gm.	30 gm. (est.)	131 gm.	137 gm.	150 gm.	150 gm.	114 gm.	NONE
BOOSTER:	in Fuze	in Fuze	in Fuze	in Fuze	in Fuze	in Fuze	in Fuze	NONE
FUZE:	Bd.Z. 8.8-Pzgr.	Bd.Z. 5127	Bd.Z.F. 8.8cm. Pzgr.	Bd.Z. 5127	Bd.Z.F. 8.8cm. Pzgr.	Bd.Z. 5127	Bd.Z. 5103 Bd.Z. 103/1	NONE
COLOR:	Black	Black with White Tip	Black	Black	Black w/ Red Markings	Black w/ Red Markings	Black w/ Red Markings	Black
EXPLOSIVE CAVITY SIZE:	Small	Small	Large	Large	Large	Large	Large	NONE

ENTRY	9	10	11	12	13	14	15	16
GERMAN DESIGNATION:	Sprgr. 43	Sprgr. L/4.5	Sprgr. L/4.5 Zt.Z.	Gr. 39 H.L.	Sprgr. Patr. L/4.5 (Kz)	Sprgr. Patr. L/4.7 FES	Sprgr. Flak 41	Gr.Br. Schr. Flak
FOR WEAPON:	Kw.K 43 Stu.K 43 Pak 43 Pak 43/41	Flak 18 Flak 36 Flak 37 Kw.K 36 Flak 39(r)	Flak 18 Flak 36 Flak 37 Kw.K 36 Flak 39(r)	Kw.K 36 Kw.K 43 Pak 43 Pak 43/41	Flak 18 Flak 36 Flak 37	Flak 41	Flak 41	Flak 18 Flak 36 Flak 37
WEIGHT:	9.54 Kg.	9.32 Kg.	9.54 Kg.	7.72 Kg.	9.24 Kg.	9.40 Kg.	9.31 Kg.	9.10 Kg.
BURSTING CHARGE:	Poured Amatal	Poured Amatal	Poured Amatal	Pressed Cyclonite/Wax	Amatal	Amatal	Amatal	TNT or Amatal/Wax
CHARGE WEIGHT:	1.0 Kg.	.91 Kg.	.91 Kg.	.91 Kg.	.86 Kg.	.86 Kg.	.68 Kg.	.10 Kg.
BOOSTER:	Zdlig. Np. 10	Wif. Np. 10	Gr. Zdlig. C 98	PETN Type is Unknown	C 98	C 98	Np. 10	Integral
FUZE:	A.Z. 23/28 or Dopp.Z.	A.Z. 23/28	Zt.Z. S/30	A.Z. 38	A.Z. 23/28 or Zt.Z. S/30	A.Z. 23/28 or Zt.Z. S/30	Zt.Z. S/30 Fgl.	Zt.Z. S/30
COLOR:	Olive Drab	Yellow with Black Mark.	Yellow with Black Mark.	Olive Drab	Yellow or Green	Yellow	Yellow with Black Mark.	Blue body, Red Ogive, Green tip
NOTES:			Controlled Frag. HE			Soft iron rotating Band	Controlled Frag. HE	Incendiary-Shrapnel

TABLE II.
88mm CARTRIDGE DATA

	56 Cal.	71 Cal.
Designation	6347	8.8cm Flak 41 (Fixed)
Length	568mm	880mm
Mouth Diameter	90.5mm	90.5mm
Shoulder Dia.	96.7mm	105mm
Rim Diameter	102mm	123mm
Weight	5.28 Kg.	6.08 Kg.

caliber pieces were ballistically identical. The principal differences between the 56 and 71 caliber guns, outside of bore length was chamber size. Table I. shows 88mm gun employment, listing all weapons.

Ammunition for both weapons was of the fixed type...projectile and cartridge case were shipped and loaded into the gun as one piece. Early cartridge cases were made from brass; later ones from brass-plated steel; and finally, from non-plated steel. Ob-

TABLE III.
**TYPICAL 88mm Projectile/
Propellant WEIGHT RATIOS**

Projectile Type	56 Cal.	71 Cal.
HE	3.7	4.0
APCBCHE	3.7	1.8
HVAP	3.1	1.5
HEAT	6.4	5.3

turation (propellant gas seal) was accomplished by expansion of the neck and shoulder of the cartridge case against the chamber walls. Primers were either percussion type: C/12nA; or electrical type: C/22. The propellant was named Diglycol and was a double base variety. Its composition was styhylene glycoldinate and nitrocelluouse. An alternate propellant, Gudol, was sometimes used, principally in the 71 caliber guns. Gudol was composed of Diglycol with nitroguanidine added. Tables II. and III. present cartridge case and propellant data.

Ammunition types consisted of: 1) conventional high explosive, 2) armor piercing, 3) tungsten carbide core armor piercing, 4) shaped or hollow charge, 5) special fragmentation high explosive, and 6) incendiary shrapnal. No chemical rounds or armor piercing discarding sabot type ammunition was loaded as standard practice.

High explosive projectiles, termed "Sprenggranate", were loaded with Amatol. These rounds were nose fuze, either as percussion for ground use, or as mechanical time for antiaircraft or airburst/ground employment.

Armor piercing rounds were termed "Panzergranate". These had an armor piercing cap, ballistic cap and a percussion base-fuzed high explosive bursting charge. Such a round usually had a smoke tracer included as part of the fuze, and the complete round classified as APCBCHE.

The tungsten carbide cored AP round contained a 139mm long by 36mm diameter core. The projectile had a plastic cap over the core and also mounted a ballistic cap...the configuration known as HVAP or APCR. This round could be used in both 56 and 71 caliber guns, depending upon the cartridge case. It had no bursting charge and, consequently, no fuze. A smoke tracer was inserted into the base. This round belonged to the German series commonly called "AP40".

Shaped charge (HEAT) rounds were nose fuze, with a flash tube proceeding directly to a booster in the projectile base. Charge shape was hemispheric and it was contained behind a metal liner. A conical standoff was inserted over the charge. The ballistic shield containing the fuze was constructed to collapse upon impact...the degree of collapse gauged to bring the standoff to optimum

TABLE IV. **88mm PROJECTILE FUZE DATA**

Fuze	Place.	Type	Length	Max. Dia.	Threads	Delay or Run Time
A.Z. 23/28	Nose	Mechanical Impact or Graze	90.5mm	60.2mm	12.7mm	Instantaneous or 0.1 sec. delay
A.Z. 38	Nose	Mechanical Impact	28.6mm	23.8mm	6.3mm	Instantaneous
Zt.Z. S/30	Nose	Mechanical Time (Spring)	111 mm	60.4mm	12.7 mm	Up to 30 sec. delay
Zt.Z.S/30Fgl.	Nose	Mechanical Time (Centrifugal)	111 mm	60.4mm	12.7mm	Up to 30 sec. delay
Dopp.Z.	Nose	Mechanical Time (Spring)	111 mm	60.4mm	12.7mm	60, 90, or 160 sec. delay
Bd.ZF. 8.8cm Pzgr. (Large)	Base	Mechanical Impact	63.5mm	65.0mm	19 mm	Variable within ignition tolerance, allows for detonation after penetration
Bd.Z. 8.8cm Pzgr. (Small)	Base	Mechanical Impact	58.6mm	20.3mm	20.3mm	Variable as above
Bd.Z. 5/27	Base	Mechanical Impact	58.4mm	30mm(*)	16.5mm	Variable as above
Bd.Z. 5/103,-/1	Base	No Data Available				

Notes - In the A.Z. 23 28, optional delay pellets for 0.8, 0.15 and 0.25 seconds existed — a 0.02 pellet was intended, but experience with its use in 75mm ammunition showed that it would be unsuitable. In the table (*) indicates an estimated figure.

proximity of the target at the time of detonation. This collapse varied greatly with projectile strike angle (and the round was also prone to deflection). Consequently, the explosive was not usually directed uniformly. Battlefield penetrations ranged from 60mm to 180 mm, with typical performance around 100 mm. A tracer was also inserted into the base of the projectile.

TABLE VI. 88mm AMMUNITION ARMOR-PENETRATION

Type	56 Caliber			71 Caliber		
	APCBCHE	HVAP	HE	APCBCHE	HVAP	HE
Projectile	Pzgr. 39	Pzgr. 40	Sprgr. L/4.5	Pzgr. 39/43	Pzgr. 40	Sprgr. 43
Muzzle Velocity	810m/s	935m/s	818m/s	1000m/s	1125m/s	750m/s
Pen. at 500m.	140mm	225mm	73mm	205mm	270mm	77mm
" " 1000m.	122mm	194mm	64mm	186mm	233mm	70mm
" " 1500m.	108mm	171mm	56mm	170mm	205mm	64mm
" " 2000m.	92mm	145mm	48mm	154mm	175mm	58mm
" " 2500m.	82mm	122mm	40mm	140mm	147mm	52mm

Note - All penetrations are at perpendicular angle of strike on an armor plate with a figure-of-merit of approximately 1.2.

Special controlled-fragmentation rounds were designed for anti-aircraft and anti-personnel use. Shells were nose fuze for time; no electronic VT fuzes were available to the Germans during the war. To assist in fragmentation, the projectile case was serrated with 15 equally spaced longitudinal grooves. Though shape and dimensions sometimes varied with manufacturer, most grooves were triangular in cross-section, cut about 4mm deep and extending from slightly forward of the bourellet to the rotating band.

The incendiary shrapnel round was extremely complex. It had a mechanical time fuze in the nose which activated both an ignition system and a bursting charge. Upon detonation, 72 metal-alloy incendiary pellets were scattered laterally. These pellets were placed in four tiers of 18, surrounding a central bursting tube and three flash tubes. Pellet composition was: Barium Nitrate - 48% Magnesium alloy - 24.6%, Aluminum alloy - 24.6% and an insoluble acid - 2.8%. Impact and penetration of one of these pellets did wonders for aircraft or vehicle fuel tanks.

Table IV. (on page 21) presents physical details of 88mm projectiles. Table V. provides fuze information, and Table VI. compares the armor penetration of typical HE, APCBCHE and HV AP rounds for both the 56 and 71 caliber weapons. Complete round data for a sampling of 88mm ammunition is presented in Table VII.

Battlefield employment of the rounds followed typical doctrine with some improvisations. The HE rounds could be used for penetration of some light armored vehicles. On those with heavier armor, successful operation of the fuze train could not be guaranteed, even though penetration might be achieved. Time fuze and controlled fragmentation rounds were useful against infantry in the open and against personnel in open-topped vehicles and emplacements. During the flux of combat, if any rear areas, bivouac, supply and maintenance facilities came within 88mm range, controlled fragmentation and incendiary shrapnel might be included with regular HE rounds. In such cases, long-running Dopp. Z. fuzes were required.

When enemy tanks and infantry were advancing on a German position in close proximity, such as Soviet infantry riding on T-34's, hollow charge rounds impacting on the glacis plate or turret not only took care of the tank, but also eliminated the infantry. Otherwise, a HE round (timed, impact or controlled fragmentation) would be fired first for infantry effect, then followed by an anti-tank round. Armor piercing Pzgr. 40 ammunition was extremely costly to produce and its use was restricted to armor that was resistant to APCBCHE. Such vehicles were mostly encountered on the Russian front (KV and JS series heavy tanks in particular)... the western allies had little that could not be put out-of-action by APCBCHE. German anti-tank guns (generally) had enemy AFV silhouettes painted on the reverse side of the gun shields, in black, with vehicle vulnerable areas painted in red.

Future articles of this type will deal with topics such as German 75mm tank/anti-tank ammunition, Italian tank/anti-tank ammunition, Japanese ammunition, etc....

Reader comments would be greatly appreciated and criticisms welcomed....

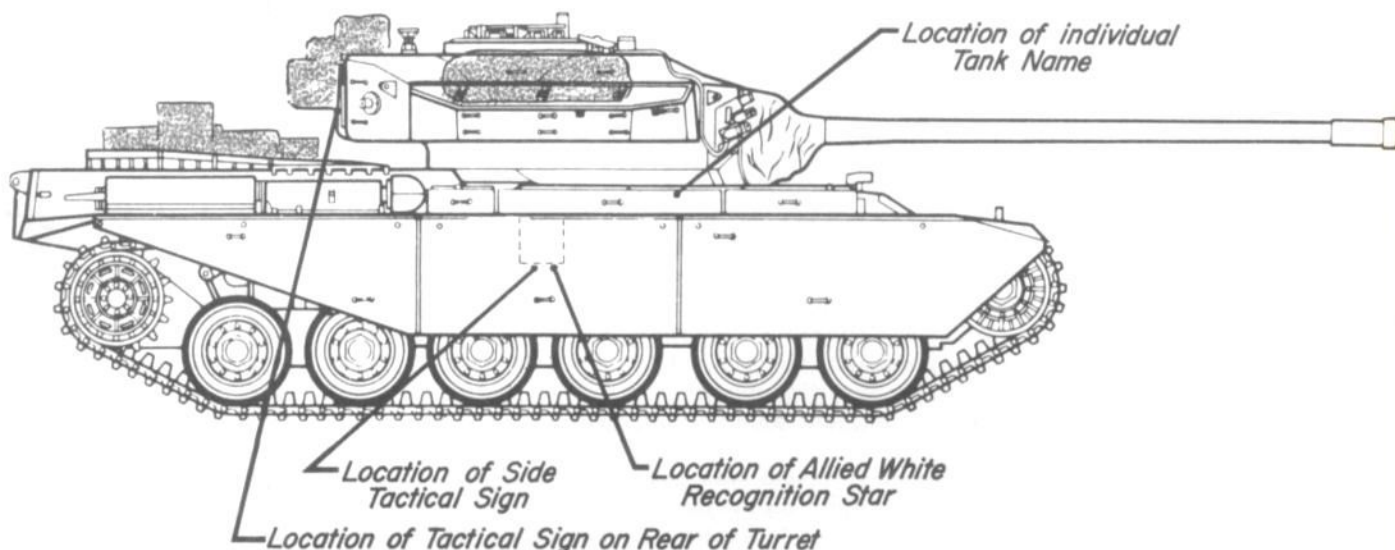
TABLE VII. COMPLETE ROUNDS

Designation	Caliber	Length	Weight	Propellant
Pzgr. Patr. 39	71	1158mm	20.9 Kg.	5.42 Kg.
Sprgr. Patr. L/4.7 FES	71	1193mm	21.1 Kg.	6.25 Kg.
Pzgr. Patr. 40	71	1177mm	18.2 Kg.	4.85 Kg.
Pzgr. Patr. 40	56	863mm	14.9 Kg.	2.35 Kg.
Pzgr. Patr. m Bd Z	56	870mm	16.0 Kg.	2.57 Kg.

COLOR 'N CAMOUFLAGE

The British Centurion Mk.3 in Korea, 1951

by S.A.C. Dunstan



Side View - Centurion Mk.3 Tank of 8th K.R.I.H. in Korea, 1951

Probably the most successful post-war AFV story is that of the British Centurion, which after more than 25 years of service is still a powerful battle tank. Originally designed to combat the highly effective German tanks in Europe, it was not until the winter of 1950 that the Centurion first saw action amongst the rugged hills of Korea.



Formation Sign -
29th British Infantry
Brigade

The Centurion was initially armed with the 17-pdr gun but was upgunned in the Mk.3 version with the 20-pdr (83.4mm). This highly accurate tank gun together with the outstanding agility of the Centurion proved invaluable in Korea where seemingly unclimbable hills were scaled, from which direct fire could be brought to bear on Communist positions. The later versions mount the 105mm L7A1 standard NATO tank gun and are being replaced in the British army with the Chieftain main battle tank. The Centurion has been sold to a dozen countries and has proved its worth in such diverse campaigns as the Indian-

Pakistan war, the Arab-Israeli conflict and the Vietnam war.

The subject of this month's article is a Centurion Mk.3 commanded by Captain George Strachan of the 8th King's Royal Irish Hussars who were amongst the first British Commonwealth units to arrive in Korea. The 8th K. R. I. H. disembarked at Pusan in November 1950 and were assigned to the 29th British Infantry Brigade as armour support.

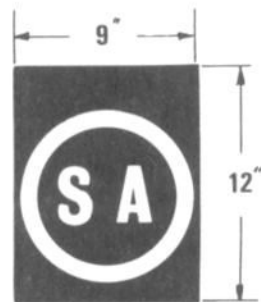
This particular Centurion fought a memorable action in February 1951 on the banks of the Han River at Yongdungpo. A "Chinese" tank was sighted across the river in Seoul and engaged at a range of 3800 yards. The second shot struck the turret and destroyed the enemy tank; it was identified as a Cromwell, a

reconn tank of the 8th Hussars that had been captured by the Chinese during a previous battle. This was the first, and therefore historic, tank versus tank battle that a Centurion had fought, paradoxically against another British tank.

The Centurion was painted over-all in the standard Bronze-Green typical of post-war British tanks.

Identification markings, which followed no strict pattern in Korea, were

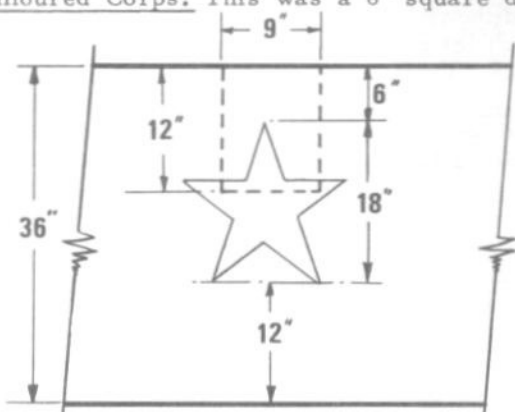
BRITISH BRONZE-GREEN
5 pts Floquil M46 Dk. Green
3 pts Floquil RR50 Dk. Blue
1 pt Floquil RR31 Yellow
1 pt Floquil RR10 Black



Tactical Sign - "C" Squadron,
Headquarters

applied to the front, the side plates and to the hull and turret rear. As you face the tank, the formation sign was applied to the right front trackguard; it consisted of a 6" black square which contained a white ring. This was the insignia of the 29th British Infantry Brigade who comprised the first battalion Royal Northumberland Fusiliers, the first battalion of the Gloucester Regiment, the first battalion of the Royal Ulster Rifles and the 45th Field Regiment Royal Artillery. On this particular Centurion the black square contained the normal solid ring, but other tanks of the regiment carried a broken ring as applied by a stencil. Tank personnel also wore the brigade insignia as a shoulder flash. The "O" of the insignia is said to have originated during World War II, from the name of the first formation commander, General Oliver Leese.

Contrary to normal practice, our Centurion carried no Arm-of-Service badge, though other tanks of the Hussars wore the red and yellow flash of the Royal Armoured Corps. This was a 6" square divided diagonally,



Locations & Dimensions of Allied Forces White Recognition Star on Side of Centurions.
(Dashed lines indicate location of Tactical Sign.)

The "S" indicated the Squadron H.Q. Troop and "A" the second tank within the troop. The circle following World War II. practice, indicated "C" Squadron. This tactical sign was repeated on the turret rear on a plate fixed to the spare "jerry" can.

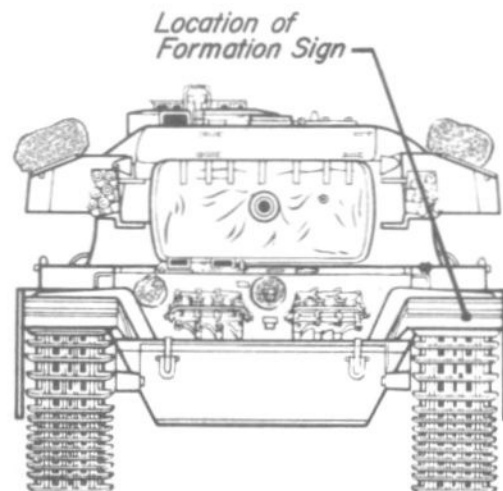
During W.W.II, British military vehicles carried a 6" diameter white disc on the rear as a convoy sign. This was superseded by a 12" by 6" white rectangle, divided vertically by three 1-1/2" black stripes, painted centrally on the exhaust deflector.

The tanks of the 8th K.R.I.H. were given nicknames; these were the names of famous race horses beginning with the Squadron letter. They were painted in 2" high white letters on the side of the center stowage bin on the trackguard. The nickname of our Centurion was obscured by dust and accumulated grime and cannot be discerned in the photographs available.

The 8th K.R.I.H. played a prominent part throughout the early mobile phases of the Korean war and fought with conspicuous gallantry at the battle of the Imjin River in April 1951, when they covered the withdrawal of the Belgian battalion in heroic fashion.

It was decided in July 1951 to integrate all the Commonwealth units into one formation and the First British Commonwealth Division was born. New insignia now

- Continued on Page 33 -

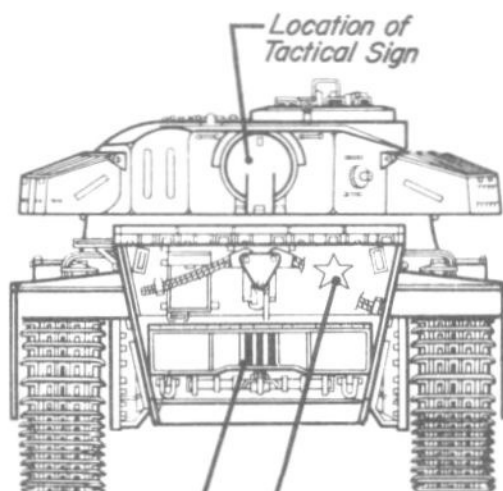


Front View - Centurion Mk.3 Tank

red over yellow, and was applied to the left front trackguard. In the center of this square appeared the Unit Serial Number "41" painted in 2" high black figures.

The Allied Forces white recognition star was prominently displayed on the side plates of this vehicle. The dimensions of the white stars are shown at left; and they were positioned centrally on the second anti-bazooka plate on either side. An 8" white star was also carried on the rear hull plate between the towing hook and the hawser holder. Other Centurions carried an additional recognition star on a stowage bin that replaced the right hand spare track links on the glacis plate.

Tactical signs were painted in white on black metal plates which were hung over the side plates; on this vehicle over the top of the recognition stars. These indicated the Troop number and tank letter within the squadron sign and on our Centurion was "SA" within a circle.



Rear View - 8th K.R.I.H. Centurion

The Jagdpanzer 38 t TD Company

by James Steuard

In May of 1944, the first deliveries of the new Jagdpanzer 38(t) took place to German units. This new tank destroyer was small and light, weighing only 16 tons, and mounted the powerful 7.5cm Pak 39 anti-tank gun which was capable of handling almost all enemy armor. It was planned to use this new weapon to partially motorize the anti-tank (Panzerjäger) battalions of Infanterie Divisions, especially those on the Eastern front. As planned production of the Jagdpanzer IV, tank destroyer was not reached, the Jagdpanzer 38(t) was also listed as a substitute vehicle, and it was used to equip self-propelled anti-tank companies of some Panzer and Panzergrenadier Divisions in late 1944 and early 1945.

While there was a KStN published in mid-1944 to cover early organizational efforts, KStN 1149(f.G.) was published in November 1944 to cover changes in organization of Jagdpanzer IV./Jagdpanzer 38(t) anti-tank companies. The chart on the opposite page illustrates this late-war unit.

The Jagdpanzer-Kompanie, as illustrated, could be equipped with either 13 or 10 vehicles (depending upon availability). The illustration shows the unit as organized with 13 tank destroyers; in the 10 vehicle configuration, the three platoons each had three instead of four "Hetzers".

The Company Headquarters was organized with 1 officer, 5 non-commissioned officers, and 6 enlisted men. The company commander and his radio section were provided with a medium car (m. Pkw., Kfz. 15) which was equipped with Fu. 8, Fu. 4 and Fu. 5 radio sets. A footnote in the KStN indicates that, if substitutes were available, this medium car could be replaced by an armored vehicle (type unspecified). The Headquarters also included a Kettenkrad tracked motorcycle carrying two messengers; a footnote indicates that if the Kettenkrad was not available, either a light car (le. Pkw., Kfz. 1) or a heavy motorcycle with sidecar could be substituted. The company's First Sergeant/administration section was provided with a light car (typically a VW Kübelwagen) and the Headquarters also included one Jagdpanzer 38(t) for the company commander to use in combat.

Most armor publications that survey German armored vehicles do not list the Jagdpanzer 38(t) with a Sonder-Kraftfahrzeuge (Sd. Kfz.) number, listing the vehicle instead with only the designation. KStN 1149 designates the Jagdpanzer 38(t) as Sd. Kfz. 138/2, an all-together logical assignment as the numbers "138" and "138/1" were used to designate other earlier variants on the same-Czech built chassis.

The three combat platoons of the Jagdpanzer-Kompanie were identically organized, with the exception of the 3rd Platoon (3. Zug) which had a non-commissioned officer as the Platoon Leader. Each platoon had 1 officer (NCO) platoon leader, 12 non-commissioned officers and 6 enlisted men. The Platoon Leader was provided with a light car, which was also used by the Forward Observer Sgt., who functioned as a reconnaissance specialist as required. A 350cc light motorcycle was assigned to each platoon for messenger duties, and the platoon had four of the excellent Jagdpanzer 38(t) tank destroyers. As can be seen, there was no "Platoon Sergeant" in the U.S. Army sense; one of the non-commissioned officer vehicle commanders acted as an assistant platoon leader, taking command of the platoon in the absence of the normal platoon leader.

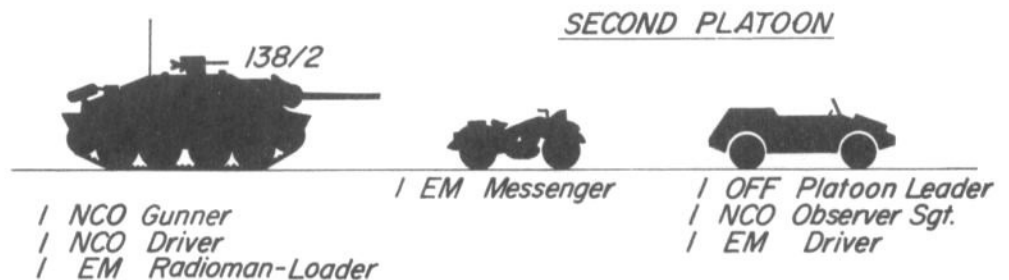
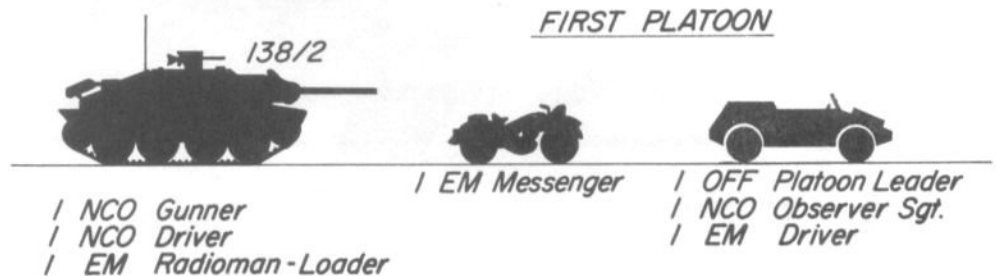
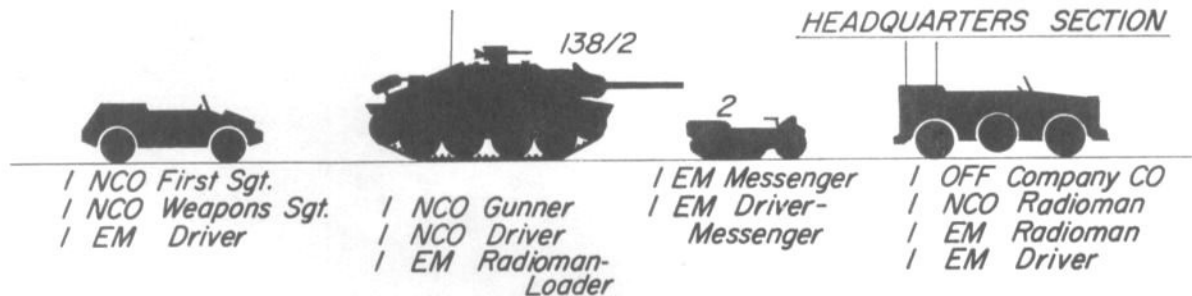
As the company was organized under the "frei-Gliederung" (or f.G.) concept, there was no Maintenance Section, Supply Section or Company Trains. These functions were instead concentrated in the battalion headquarters company (or Stabs-Kompanie) for centralized control and concentration of effort with less manpower.

Footnotes in the KStN indicate that three enlisted men of the company were to be provided with medical training in addition to their normally assigned tasks. These men were to function as combat medics as required in combat. One NCO and 5 enlisted men were to form a Gas Detection Section, to be used if needed. The company had a total of 3 officers, 42 non-commissioned officers, and 24 enlisted men. These men were equipped with 44 pistols, 1 sub-machine gun and 11 rifles. Each Jagdpanzer 38(t), in addition to its main armament, was equipped with one light machine gun (either a MG34 or a MG42) mounted in a 360 degree traverse, remote-controlled, roof mount, and one MP40 submachine gun. Incidentally, the KStN indicates that the Gunners of the "Hetzers" were not armed; instead, they were to use the vehicular MP40s if weapons were needed.

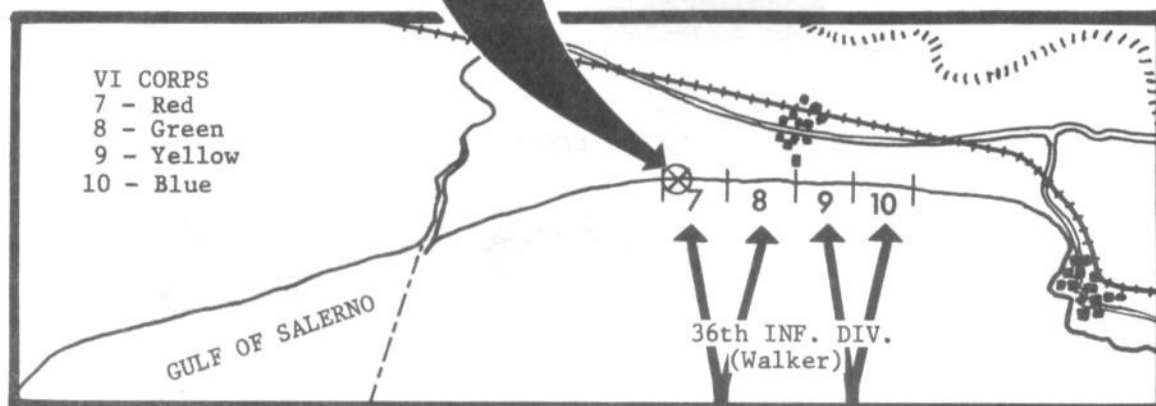
Although the late-war Jagdpanzer-Kompanie displays substitution and simplification, due no doubt to lack of manpower and inadequate supplies of equipment, the unit still was a powerful and extremely useful force that could be employed successfully against enemy tanks, using the powerfully armed, fast and maneuverable Jagdpanzer 38(t) "Hetzer" tank destroyer.

JAGDPANZER-KOMPANIE (JAGDPANZER 38)

KStN 1149 (f.G.) of 1 November 1944



THIRD PLATOON - Identical to First Platoon, except Platoon Leader is a NCO.



A SEGMENT OF SALERNO BEACH IN MINIATURE

by F.J. "Rick" Tyson

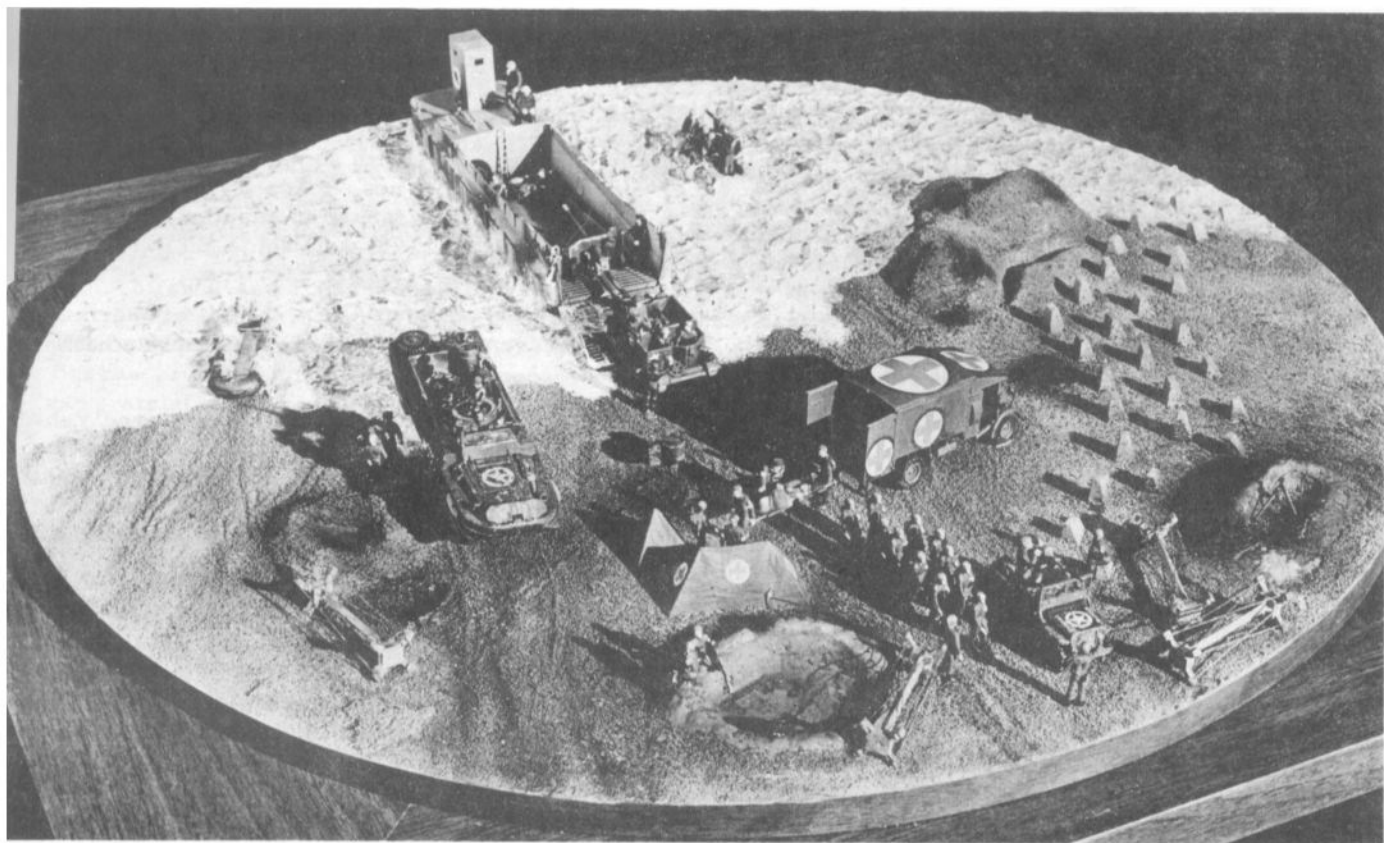
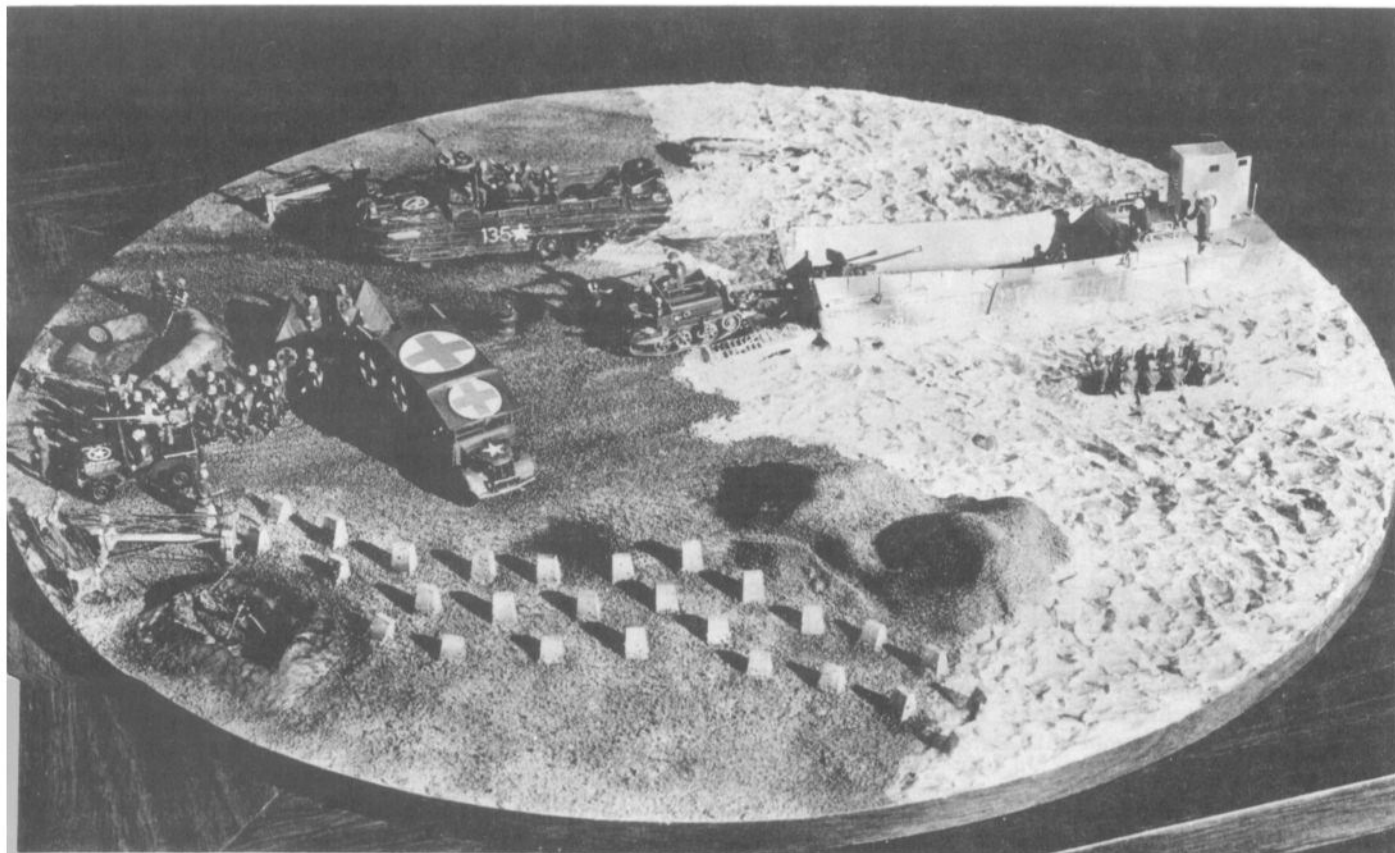
This diorama depicts of a small portion of 36th Infantry Division's landing at Red Beach on September 9th, 1943.

This diorama was constructed in 1/76 scale for use in promoting the new National Infantry Museum at Fort Benning, Georgia. This diorama is one of a series being used to gain funds for the National 1972-73 Fund Drive.

The diorama is constructed on a plywood base covered with formica. The beach is made of "Green Stuff" covered with Life-like scenic sand. The water is made from Liquidtex Polymer Gel Medium and Liquidtex matt polymer mixed with Liquidtex greens, blues, and white to reconstruct a churned up water common to landing activities.

Items making up the diorama are: one Airfix LCM, one Airfix Duck, one Airfix Bren Gun carrier and 6 lb'er, one Airfix jeep, Bellona emplacements, Minitanks American soldiers, wire entanglements, dragon's teeth, landing rafts and tents. Also used were, Armtec's tool and weapon sets.

Total time utilized in creating diorama was seventy hours. It was presented at the annual convention of the "T-Patcher's" (36th Inf. Div.) in Dallas, Texas, Labor Day weekend, 1972.





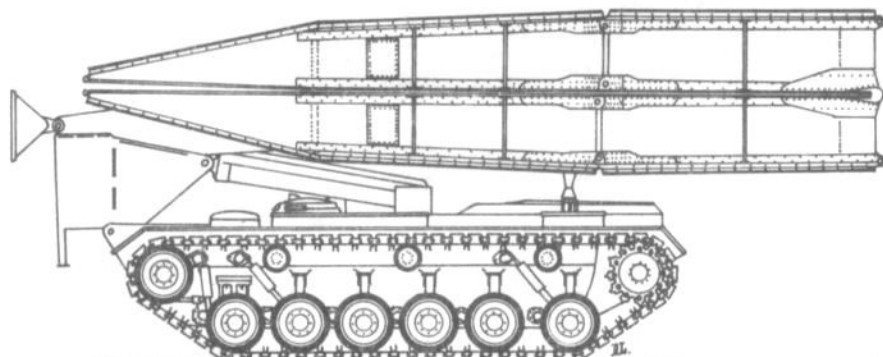
ARMOR G-2

Current Data on the World's
Armored Forces .

by J. C. Johns

ARGENTINA: The Argentine Army has recently received U.S.-made M-113A1 Armored Personnel Carriers. These amphibious tracked-carriers are armed with a .50 caliber cupola-mounted MG.

GREAT BRITAIN: The "Conqueror" Battle Tank is now out-of-service in the British Army, and the remaining vehicles are now being used as targets on tank firing ranges. The Conqueror was armed with a 120mm main gun, one 7.62mm coaxial Browning MG and one anti-aircraft MG. It weighed 65 tons, was powered with an 810 HP engine and had a crew of four.



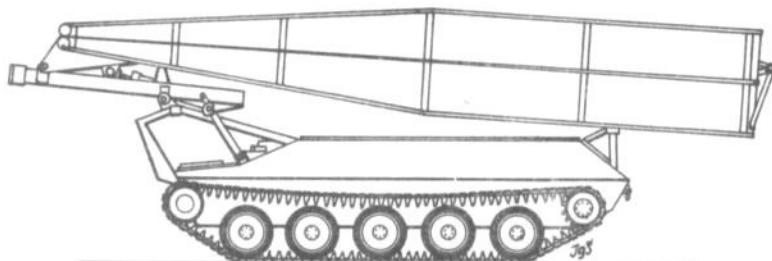
Israeli M48 Armored Vehicle Launching Bridge (M48A2 chassis)

ISRAEL: Israel has obtained U.S.-made M-48 and M-60 Armored Vehicle Launching Bridges, as shown at left.

TANZANIA: The Army now has about 20 Chinese-made T-59 medium tanks (these are copies of the Soviet T-54 tank). They are also equipped with some BTR-40's, 14 Chinese-made T-60 amphibious tanks (an adaption of the PT-76) and some BTR-152 personnel carriers.

UGANDA: The Ugandan Army has about 15 British-made Ferret Scout Cars, 12 M-4 "Sherman" Medium Tanks, and 36 Czech-made OT-64B Armored Personnel Carriers. Approximately half of these vehicles are operational.

UNITED STATES: U.S. Army Engineers have been working on the development of an Armored Vehicle Launching Bridge, based on the chassis of the M-551 "Sheridan" Light Reconnaissance Tank. The drawing at the left is an attempt to depict this vehicle's configuration.



United States XM-551 Armored Vehicle Launching Bridge

VENEZUELA: Venezuela has placed an order for 142 French-made AMX-30 Main Battle Tanks. This vehicle has a 4-man crew; weighs about 40-tons combat loaded; has a speed cross country of 25 m. p. h. and a radius-of-

action of 350 miles. The tank's armament consists of a 105mm semi-automatic main gun; secondary weapon is either a 12mm machine gun or a 20mm automatic cannon coaxially mounted. The commander's cupola is equipped with a 7.62mm machine gun.



Book Review: German Halftracks in Action, by Uwe Feist, Captions by Kurt Rieger (Squadron/Signal Publications, Warren, Michigan, \$3.95)

Review by James Steuard

In a similar style to the other publications in the "Armor" series, this publication covers all German halftrack vehicles excepting the Sd.Kfz. 250 and Sd.Kfz. 251 armored halftracks which were given coverage in a separate publication. Starting with the Sd.Kfz. 2 "Kettenkrad", this new book provides text and photographs on the "Maultier" halftrack trucks, the fully-tracked "Raupenschlepper Ost" and the prime-mover halftracks (Sd.Kfz. 10, 10/4, 11, 6, 7, 8, and 9). All together, there are 83 photographs, 3 color side-view drawings (on the covers) and 2 tone-shaded side-views, for a very impressive booklet. Unfortunately, the coverage is a bit "spotty"; the unarmored "Maultier" trucks are, for example, covered with only 2 photographs and 1-1/3rd page of text, and the "schwerer Wehrmacht-Schlepper" is provided with only one page and a tone-shaded drawing. It is hoped that there will be a later volume giving greater coverage to these vehicles. As with earlier volumes, there are some text and/or caption errors, but nothing that is of critical nature. This book will prove to be of interest to modelers and historians alike, as there is really fine photographic coverage of some of the vehicles, especially the Sd.Kfz. 10 and variants. Squadron/Signal should be congratulated for providing coverage to the more unusual German military vehicles.

Book Review: Walther's 1973 Military Miniatures Catalog (William K. Walthers Inc., Milwaukee, Wisconsin, \$2.00)

Review by James Steuard

The William K. Walther's company is perhaps best known to those of us who have been (or now are) Model Railroad buffs. For a great number of years, they have been a high-quality mail-order house, and they have recently broadened their lines and business to include Military Miniatures. Their new catalog (which is the First Edition) contains 88 pages of catalog information on miniature figures (and vehicles), tools, paints, decals, paint brushes, books and other material to support the fast-growing miniatures hobby. There are numerous high-quality photographs of the products offered and I had a field-day "window shopping" through the publication, marking the items that I was interested in. Walther's carries Imrie/Risley figures, the Old Guard line of miniatures and Cavalier figures as well as the GHQ Microarmour line. If you've had a hard time trying to find figures or miniatures by these companies, you might want to give Walther's a try. They are to be congratulated on producing a good library-quality catalog which contains as much information as it does at such a fair price.

Book Review: Volkswagen for the Wehrmacht, 1939-1945; a reprint of the U.S. Army Technical Manual TM E9-803 titled the German Volkswagen (Post-Era Books, Arcadia, California, \$6.00)

Review by James Steuard

During the fighting in North Africa, the U.S. Army acquired a captured military Volkswagen light car. Shipped to Aberdeen Proving Ground in 1943, the captured Kübelwagen still carried the tactical markings of a forward observation section of the 15. Panzer-Division's artillery regiment. The German "Jeep" was evaluated by U.S. Army Ordnance personnel; it was one of the first cars to be seen with an air-cooled engine, and the car was unique in that it had no frame, only a stamping which formed the floor of the vehicle. Furthermore, the car possessed a limited slip differential; something completely unknown to the American public at this time in history.

After thorough testing, the U.S. Army published TM E9-803, a technical manual designed to

- Continued on Page 33 -

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Armor Question from Readers, with
Answers from the AFV-G2 Staff.

Question: Could you please explain the system of letters and numbers used to designate U.S. Army vehicles in World War II? I'm confused by the large number of vehicles designated M3, for example.

Answer: In analysing a U.S. Army vehicle designation of the World War II. period, it is first necessary to isolate the "category" of vehicle that is being discussed. As you mentioned, there were M-3 Scout Cars, M-3 Halftracks, M-3 Gun Motor Carriages, M-3 Light Tanks, and M-3 Medium Tanks, most of which had no common parts or similarity. The term "Medium Tank" is the "category" which is of prime importance, as there might be identical letter/numeral designations in the different categories.

When a prototype vehicle was accepted for test by the U.S. Army in any of the categories, it was assigned a letter/numeral designation starting with the letter "T" (for test-?). The numbers following the "T" seem to have been assigned (roughly) in chronological order; thus, the T-12 preceded the T-15 in acceptance by the Army. If minor modifications were made (for improvement) to the "test" vehicle, an "E" suffix letter was added to the designation, followed by a chronological number; thus, the T-4E1 was a modified T-4 test vehicle. A T-4E2 would be a further modification or change from the T-4E1 or from the basic T-4.

When tests had been concluded on the prototype vehicles and they were "type accepted" for use by field units in the field, the vehicle was given a letter/numeral designation starting with the letter "M". The numbers following the "M" were assigned in acceptance order; the M-1 preceded the M-2 and the M-3 in any given category. Basic alterations in any given vehicle, such as alternate engine installations, or changed hull manufacturing techniques were indicated by a suffix letter "A" added to the designation, followed by a chronologically assigned number. Thus, the M-4 "Sherman" Medium Tank with a hull constructed from castings (instead of welded plates) was identified by the designation M-4A1, and the later version powered by a Ford GAA 500 hp. engine (in place of the Continental R975) was identified as the M-4A3.

If modifications were made to accepted vehicles, and if these modifications effected all versions of the accepted vehicle, a second suffix letter/number combination was added to the already complicated designation. This second suffix started with the letter "E" and the numbers were again assigned in chronological order. Thus the suspension change from VVSS to HVSS that effected all models of the "Sherman" Medium Tank was indicated by the suffix "E8", and there were M-4A1E8's, M-4A2E8's, M-4A3E8's, etc.

Space does not permit a longer explanation, but the above general information should help to sort-out the confusion in the U.S. Army system.

NEW PRODUCTS !

The latest modeling release from the Fujimi company is a beautiful 1:76th scale model of the Czech-built German Panzer 38(t), a light tank that saw service during the early years of WWII. This model follows the release of an excellently detailed model of the Jagdpanzer 38(t) "Hetzer". Another Japanese firm has entered the "small" modeling field: Bandai is now marketing a line of 1:48th scale armor kits! 1:48th scale (or Quarter-inch) is a rather unusual scale that hasn't been covered; it offers good detail in a reasonably-sized model. The first release to be seen from Bandai is a very well done model of the German 10.5cm "Wespe" self-propelled artillery piece; the kit features a fully-detailed gun compartment, an engine and transmission and some basic diorama construction materials. The decals are also well done and there's a lot of parts to say the least. Other Bandai releases in the same scale include the German Volkswagen Kübelwagen, the German Panzer IV., Ausf. D, and the German Hanomag Sd.Kfz. 251/1 Halftrack. News is that the Monogram company is planning on re-releasing their old armor line. This includes models of the U.S. M-3A1 Armored Personnel Halftrack and the U.S. 2-1/2 ton Military Truck. In the book field, look for "Famous Tank Battles" by Colonel Robert J. Icks; it covers 32 different armored battles in good detail.

Color 'n Camouflage: British Centurion in Korea (Continued from Page 25).

appeared and the tanks of the 8th K.R.I.H. wore on the right trackguard a blue shield with an imperial crown set above a white panel that bore the word "Commonwealth" in gold letters. The red and yellow arm-of-service flash with the unit serial number "41" was retained on the left trackguard.

The 8th K.R.I.H. took part in Operation Commando in October 1951 when the British Commonwealth Division advanced several thousand yards; however the terrain severely hampered the tanks and several were "bogged".




Operations now became static and there were very few opportunities for the effective employment of armour. The tanks were relegated to the role of self-propelled artillery and as a mobile reserve.

In December 1951, having completed their tour of duty, the 8th K.R.I.H. handed over their Centurions to the "Skins" - the 5th Royal Inniskillings Dragoon Guards.

For the modeler, Tamiya has produced an excellent model of the Centurion Mk. 3. The following points will be of interest to those who wish to model this particular vehicle:



- i) two U.S. infantry helmets were hung from the headlights on the front glacis plate.
- ii) the right rear anti-bazooka plate was missing.
- iii) an ammo box was carried on the right trackguard forward of the stowage bins (presumable for extra stowage).
- iv) two wooden crates and a jerry can were carried on the rear engine decking.
- v) tarpaulins and bedding rolls were strapped to the top of the turret stowage bins (on the sides).

Finally, the vehicle was in a weatherbeaten condition, being very dusty and and muddy around the trackwork and lower hull.



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Letters to the Editor

To the Editor:

I found Mr. R. McG's letter and Mr. D. Musikoff's reply in the Letters to the Editor column most interesting. I personally think Mr. McG's criticism of the Tamiya company is a little unfair, especially in the light of the tremendous amount of work, research and money that goes into the construction of model-making dies and tools. Frankly, I doubt that Mr. McG has any awareness of this manufacturing area (from his remarks) and he seems to take model manufacturers for granted. I do understand his desire to accurately duplicate a vehicle, but I also think his reliance on Tamiya to provide under-hull detail is a little fantastic, in light of the cost that is involved.

I am a member of a small, informal modeling group/club that is based on the ability to construct highly-accurate, scratch-built models. Most modelers that I know or have met like to "make" some aspect of their models, and it seems a little ridiculous to register so many complaints about how much work must be done to rectify errors. I somehow wonder if Mr. McG really likes to make models, or is he trying to emulate (or compete) with modelers? Myself, I'm happy to find an error, so that I can correct it. I do not find fault with companies like Tamiya who do a real service to modelers in providing such a variety of models with no major errors in them. Incidentally, I work in mixed metal and plastic modeling and am currently working on an all brass M-3 Halftrack model. I would be interested in hearing from other modelers interested in this modeling area.

D. Warner
Garden Grove, CA

To the Editor:

If Mr. McG is so dissatisfied with the models offered by Tamiya, why does he make them? And if he wants a real challenge, I would suggest he try to accurately detail an Otaki Panzer III. After that experience, he would have a lot of praise for Tamiya instead of complaints!

J. Schmidt
Chicago, Illinois

To the Editor:

I want to express my pleasure in your magazine, and especially the article series on "Color 'n Camouflage" of armored vehicles. In fact, this seems to be the only accurate source on markings and insignia used on vehicles. I would like to request that you cover several vehicles in future articles, if I may be so bold. Could you please provide articles on:

1. German vehicles in Russia, such as the Pz.IV. and the Sd.Kfz. 222.
2. Russian vehicles in 1944-45, especially the SU-85 and SU-122.
3. U.S. vehicles at Normandy.

Has your company given any thought to the publication of a book on armored markings used by the German Army in World War II? How about a book on German unit organizations?

Meanwhile, keep up the good work.

J. McKenzie
Long Beach, CA

Are any other readers interested in specific vehicles to be covered in the "C 'n C" series? - If so, drop us a note and we'll form a request list for future articles. I'd also like opinions on the book requests, as an organization book is a definite possibility..... Editor

Do you have opinions on other reader's letters - or do you have ideas or questions that are of general interest? This column is available as a forum for readers and comments are always appreciated. Why not drop us a line.....

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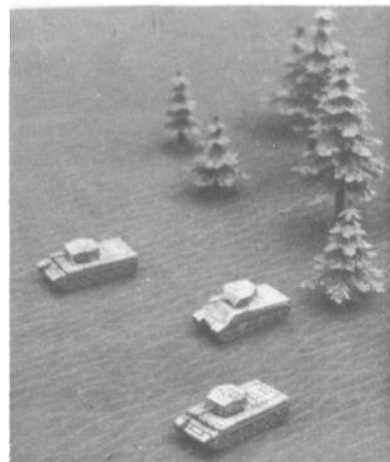
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